GROUP 42B

KEYLESS OPERATION SYSTEM (KOS)

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GENERAL INFORMATION

M14209100001USA0000010000

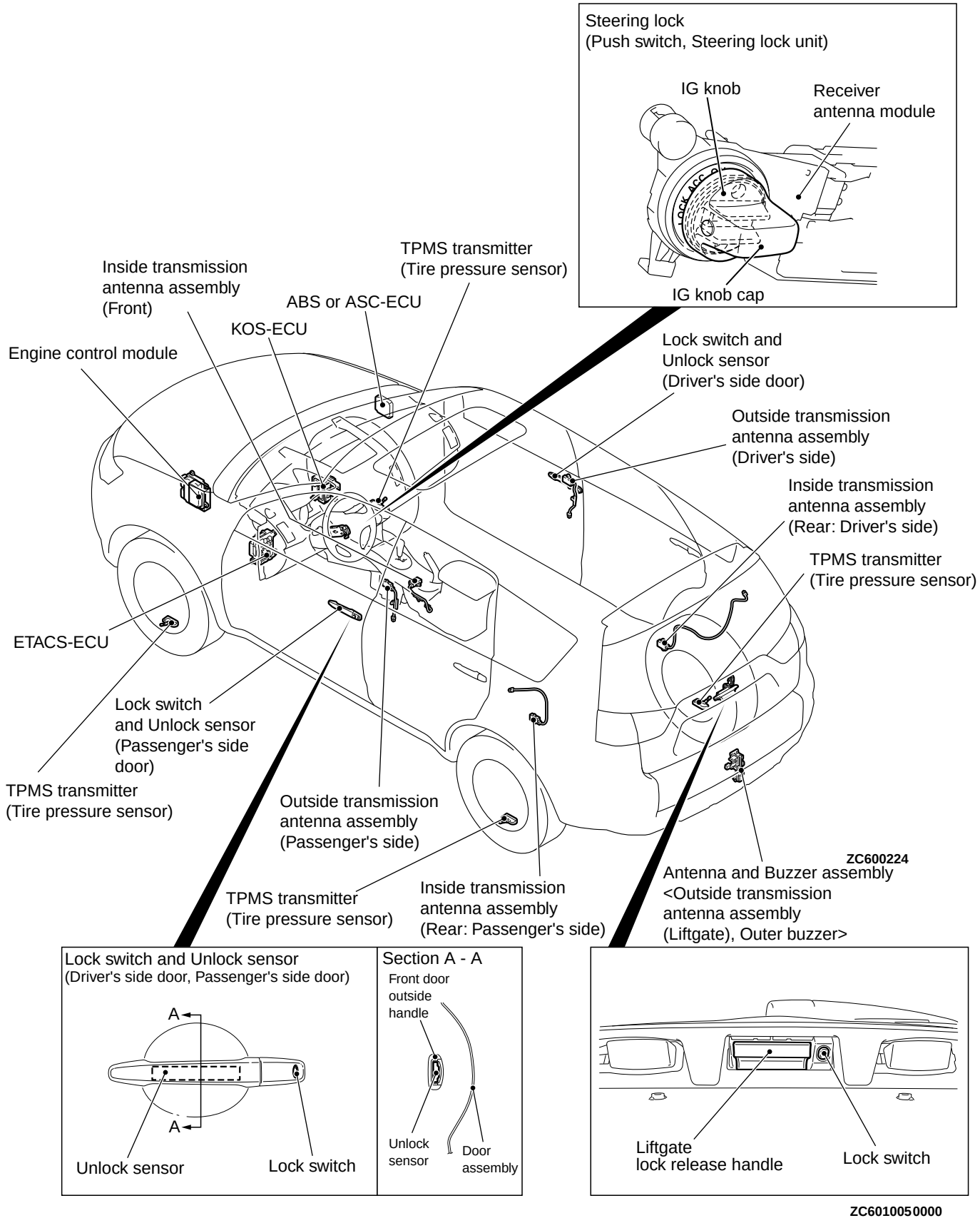
NOTE: In this manual, F.A.S.T.-key (Free-hand Advanced Security Transmitter) is described as Keyless Operation System (KOS).

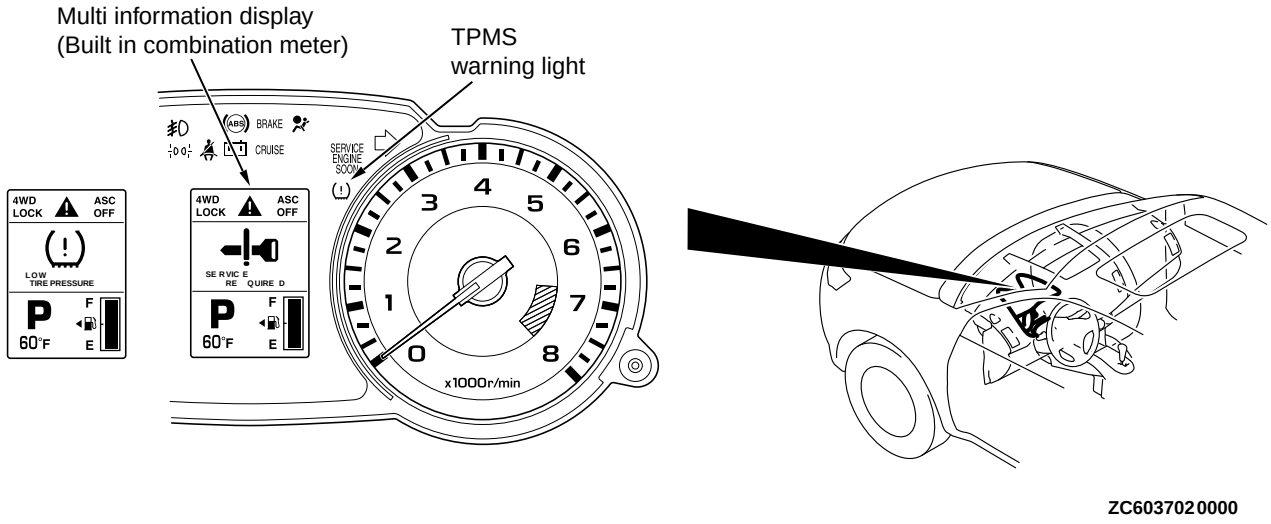
The Keyless Operation System (KOS) enables the driver to unlock all the doors* and the liftgate by just pulling the front door outside handle or operating the liftgate lock release handle, without taking the key out from his/her pocket or bag when he/she is carrying a Keyless Operation Key which has been registered in the vehicle's KOS-ECU. KOS also allows the driver to lock all the doors and the liftgate by pressing the lock switch on the front door outside handle or on the liftgate lock release handle (door entry function), and start the engine without using the conventional mechanical key (engine start function). KOS has the following features:

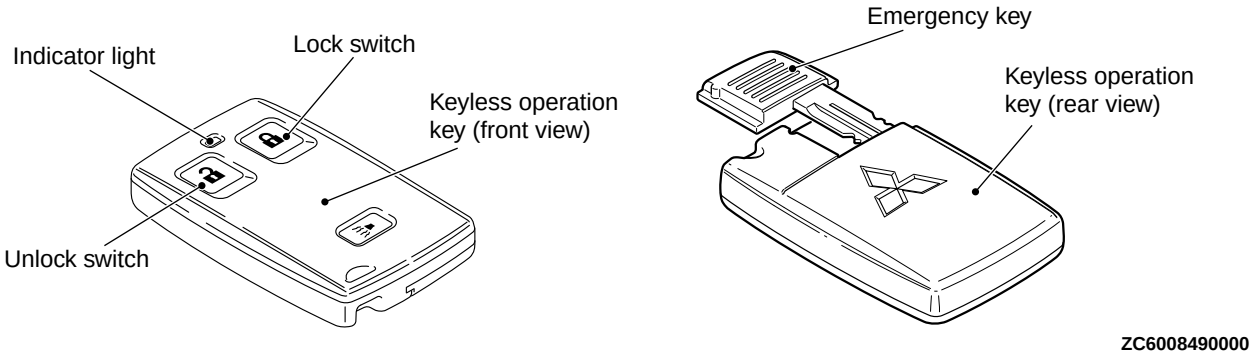
- The keyless operation key incorporates the lock and unlock switches on it. Like the conventional keyless entry system, remote control operation can be performed by using these switches. The keyless operation key also incorporates an indicator light that enables the driver to check if the signal is transmitted correctly or if the battery in the key is discharged.
- The keyless operation Key incorporates the immobilizer function that inhibits starting the engine by using an unauthorized key.
- The incorporated TPMS function monitors the air pressure of all the tires.
- Each vehicle is provided with two keyless operation keys. Up to four keyless operation keys can be registered in the vehicle's KOS-ECU.
- The keyless operation key incorporates an emergency key with a transponder to lock/unlock the doors and start the engine in case the battery in the keyless operation key is discharged or the Keyless Operation System is not working normally.
- The driver can customize KOS; enabling/disabling all the system functions, enabling the door locking/unlocking function only, or enabling the engine starting function only.

NOTE: When the driver's front door outside handle is operated, only the driver's door is unlocked.

CONSTRUCTION DIAGRAM







Main components and functions

Parts name	Functional description
KOS-ECU	Controls KOS by using the following inputs/outputs and communications. ▪Input from the unlock sensor and lock switch on each door, input from the push switch on the IG knob ▪Communications with ETACS-ECU, ECM, ABS or ASC-ECU and combination meter via CAN ▪Wire communication with the steering lock unit ▪Wireless communication with the keyless operation key via the receiver antenna module and interior/exterior transmitter antennas ▪Wireless communication with the TPMS transmitter ▪Output to the outer tone alarm
Steering lock (incorporates push switch and steering lock unit)	The steering lock has two unlocking mechanisms; a mechanical mechanism that uses an emergency key and an electrical mechanism. In the electrical unlocking mechanism, the steering lock communicates with KOS-ECU via wire, and when requested by KOS-ECU, the steering lock unlocks for two seconds.

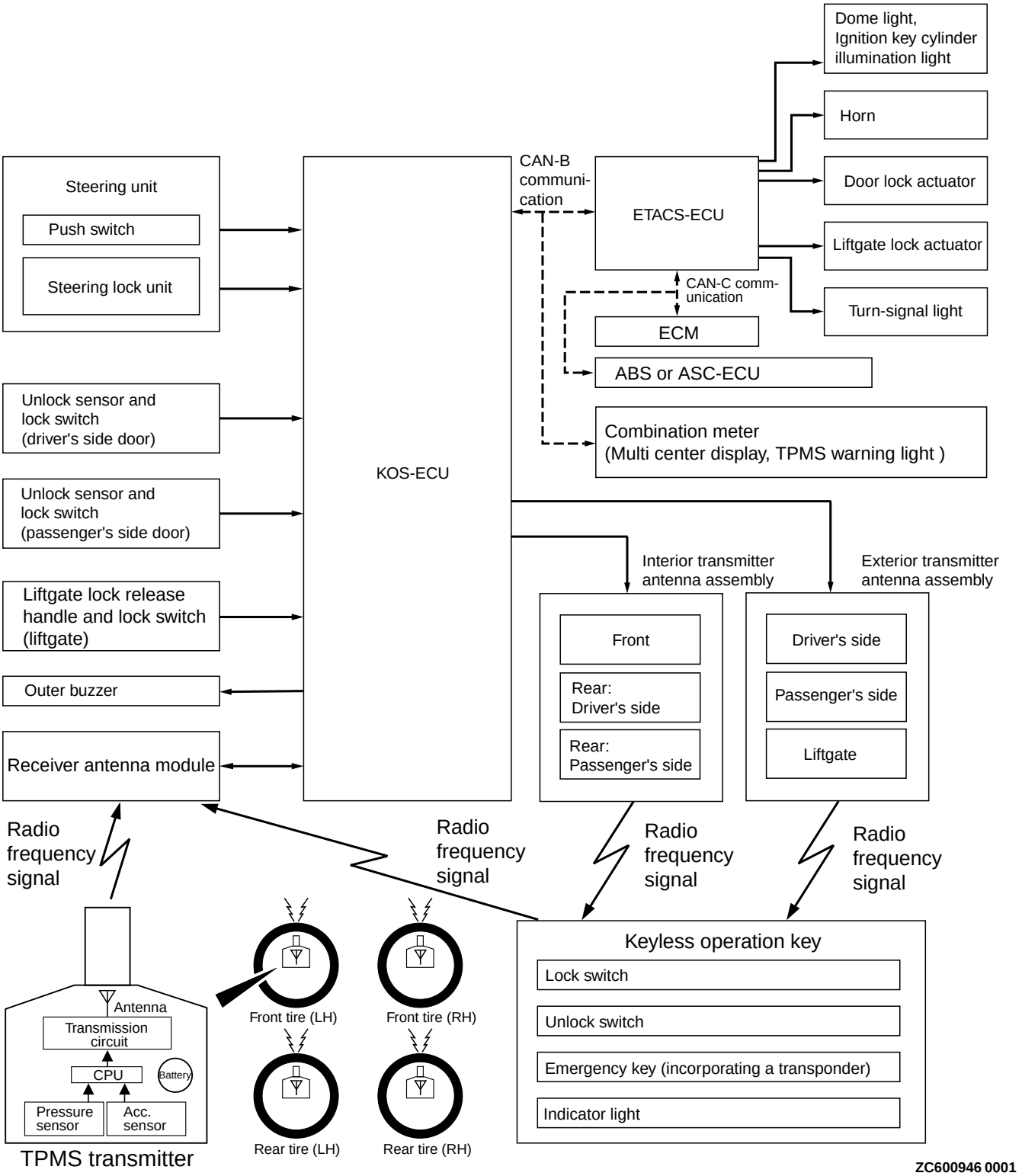
Parts name		Functional description
Keyless operation key (incorporates emergency key)		▪The keyless operation key receives signals sent from each interior/exterior transmitter antenna, certifies the keyless operation key ID code, calculates the encrypted code, and sends the reply data signal to KOS-ECU via the receiver antenna module. When the lock/unlock switch on the keyless operation key is pressed, corresponding signal is sent to KOS-ECU via the receiver antenna module. ▪If two or more keyless operation keys registered in KOS-ECU respond at the same time, their signals would interfere. To avoid this interference, each signal from KOS-ECU is given the priority*1data, and the keyless operation keys respond in accordance with this priority.
Lock switch	Driver's door	Locks all the doors and the liftgate when a driver carrying the keyless operation key presses the lock switch on the front door outside handle or on the liftgate lock release handle.
	Front passenger's door	
	Liftgate	
Unlock sensor	Driver's door	The unlock sensors incorporated in the driver's front door outside handles unlock driver's the door when a driver carrying the keyless operation key pulls the driver's door outside handle.
	Front passenger's door	The unlock sensors incorporated in the passenger's front door outside handles unlock all the doors and the liftgate when a driver carrying the keyless operation key pulls the front door outside handle.
Liftgate lock release handle		Locks all the doors and the liftgate when a driver carrying the keyless operation key presses the lock switch on the front door outside handle or on the liftgate lock release handle.
Exterior transmitter antenna assembly	Driver's side	Converts the data output from KOS-ECU via wire into a signal, and sends it to the keyless operation key.
	Front passenger's side	
Interior transmitter antenna assembly	Front	Converts the data output from KOS-ECU via wire into a signal, and sends it to the keyless operation key.
	Rear	
Antenna & tone alarm assembly	Exterior transmitter antenna assembly (liftgate)	Converts the data output from KOS-ECU via wire into a signal, and sends it to the keyless operation key.
	Outer tone alarm	The outer tone alarm sounds when: ▪The doors are locked or unlocked by the door entry function. ▪The keyless operation key is brought out of the vehicle when the IG knob is in the "LOCK" (OFF) position and the push switch is in other than the ON position. ▪The lock switch on the keyless operation switch is pressed when the IG knob is in the "LOCK" (OFF) position and the push switch is in other than the ON position. ▪The lock switch on the keyless operation key is pressed from inside the car. ▪The lock switch on the keyless operation key is pressed when the door is ajar.

Parts name	Functional description
Receiver antenna module	Receives the operation signals from the lock/unlock switches and panic alarm switch on the keyless operation key, and the air pressure signal from the TPMS transmitter, and then converts them into data and sends them to KOS-ECU.
TPMS transmitter	Measure tire pressure directly, then send radio frequency signal to receiver antenna module.
Combination meter (Multi information display, TPMS warning light)	Communicates with KOS-ECU via CAN. Receives the warning request or warning information from KOS-ECU, flashes or activates*2the warning indicator or warnig light. Warning symbol and message is additionally displayed on the multi information display
ETACS-ECU	Communicates with KOS-ECU via CAN. Send ignition switch status. Receives the door lock/unlock request from KOS-ECU, outputs the lock/unlock signal, and flashes the turn signal light to inform the driver that the doors are locked/unlocked.
ECM	Communicates with KOS-ECU via CAN. Permits/inhibits the engine starting and controls the engine operation. Send atmospheric pressure data.
ABS or ASC-ECU	Communicates with KOS-ECU via CAN. Sends the vehicle speed data.

*NOTE: *1: When registering the keyless operation keys, KOS-ECU numbers each key (1 to 4) in the order they are registered (initial priority). This priority is renewed each time the doors are locked/unlocked and the IG knob is pressed. For example, when only keys 1 and 3 have responded to the signal sent from KOS-ECU, the new priority of the keys would be 1-3-2-4. When keys 3 and 4 have responded, then the priority of the keys becomes 3-4-1-2.*

*NOTE: *2: Illuminates for tire pressure warning. Flashes for about 1 minute and then coutinuously illuminated for TPMS malfunction warning.*

System configuration



ZC600946 0001

SERVICE SPECIFICATIONS

M14209100042USA0000010000

Item	Standard value
Voltage of keyless operation key battery V	2.5 - 3.2

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M14209100044USA0000010000

Refer to GROUP 00 - Contents of troubleshooting P. 00-6.

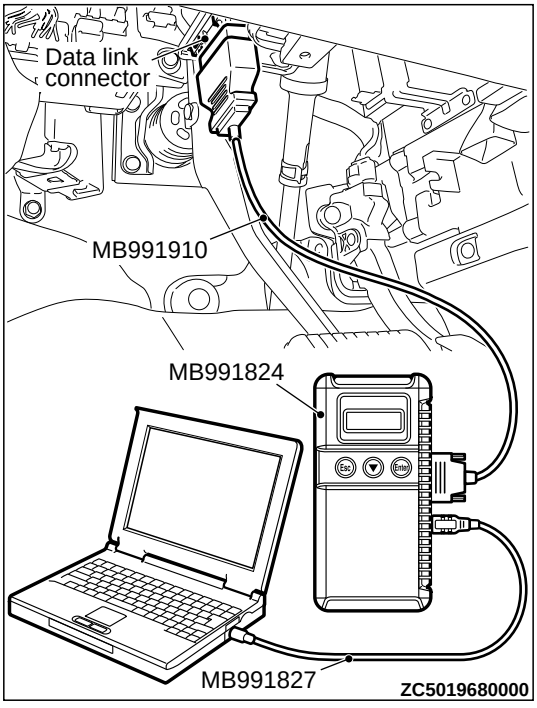
DIAGNOSTIC FUNCTION

M14209100054USA0000010000

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

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



⚠ 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 M.U.T.-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 (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

⚠ 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 "System select" from the start-up screen.
4. Select "From 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "ETACS" from "System List", and press the "OK" button.

   NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using the scan tool (GROUP 00, How to Cope with Intermittent Malfunction P.00-15).

When detecting fault and storing the DTC, the ECU connected to CAN bus line obtains the data before the determination of the DTC and the data when the DTC is determined, and then stores the ECU status of that time. By analyzing each data from scan tool, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

Item No.	Item name	Data item	Unit
01	Odometer	Total driving distance after the diagnosis code is generated	km*
02	Ignition cycle	Number of times the ignition switch is turned "ON" or "LOCK (OFF)" after the past failure transition	Number of counts is displayed.
04	Current trouble accumulative time	Cumulative time for current malfunction of diagnosis code	min

*NOTE: *: If a failure occurs to both the ABS-ECU and ETACS-ECU, 0000 km or FFFF km is displayed to the scan tool MB991958.*

ID CODES REGISTRATION JUDGMENT TABLE

M14209100048USA0000010000

⚠ CAUTION

Do not replace the engine control module and KOS-ECU at the same time. When replacing several ECUs, always replace one ECU at a time, register the necessary IDs in it, and then replace the next ECU.

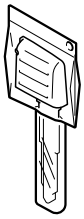
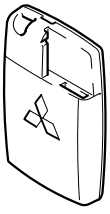
The individual unique ID code is stored in the transponder (small transmitter) and KOS-ECU integrated in the emergency key, engine control module (ECM), keyless operation key, and steering lock unit for KOS. Under the conditions shown in the table, the corresponding ID code has to be registered with KOS-ECU or the ECM again.

NOTE: The KOS-ECU memory can memorise the maximum 4 different keyless operation keys (keyless operation key ID codes) and maximum 8 different emergency keys (key IDs).

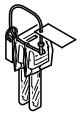
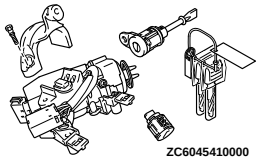
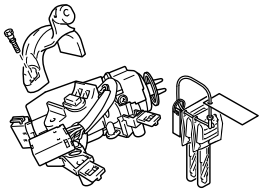
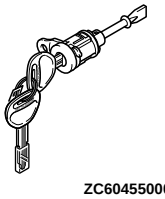
Item	Operation contents and procedure	Reference page for registration contents
When the engine control module is replaced	Registration of Key codes	Key code registration (Refer to GROUP 00 - Precautions before Service - How to Perform VIN Writing P.00-26.)
When KOS-ECU is replaced	1. Register the steering lock unit again. 2. VIN programmed 3. Register all the emergency keys again. 4. Register all the keyless operation keys again. 5. Register the TPMS transmittters	▪Steering Lock Unit Registration and Key and KOS Key Registration (Refer to P. 42B-163) ▪Write the VIN (Refer to GROUP 00 - Precautions before Service - How to Perform VIN Writing P. 00-26). ▪Registering tire pressure sensor ID. (Refer to P.42B-172.)
When the receiver antenna module is replaced	Operation is not needed	-
When a keyless operation key is added or replaced	1. Register all the emergency keys again. 2. Register all the keyless operation keys again.	Key Registration (Refer to P. 42B-163)
When a keyless operation key is lost	1. Register all emergency keys other than the lost one again. 2. Register all keyless operation keys other than the lost one again.	
When an emergency key is added as a unit	1. Register all the emergency keys again. 2. Register all the keyless operation keys again.	
When an emergency key is lost as a unit	1. Register all emergency keys other than the lost one again. 2. Register all the keyless operation keys again.	

Item	Operation contents and procedure	Reference page for registration contents
When the emargency key is replaced by the full service key set or the handle lock service key set is replaced by the piece.	1. Register all emargency keys again input barcode No. 2. Register all the keyless operation keys again.	Key (Barcode No.) and KOS Key Registration (Refer to P.42B-163)
When the blank key* is replaced by the door service key set or glove box service key set is added by the piece.	Operation is not needed	-
When TPMS transmittter is replaced	Register the TPMS trnsmittter	Registering tire pressure sensor ID. (Refer to P.42B-172.)

Key supply unit

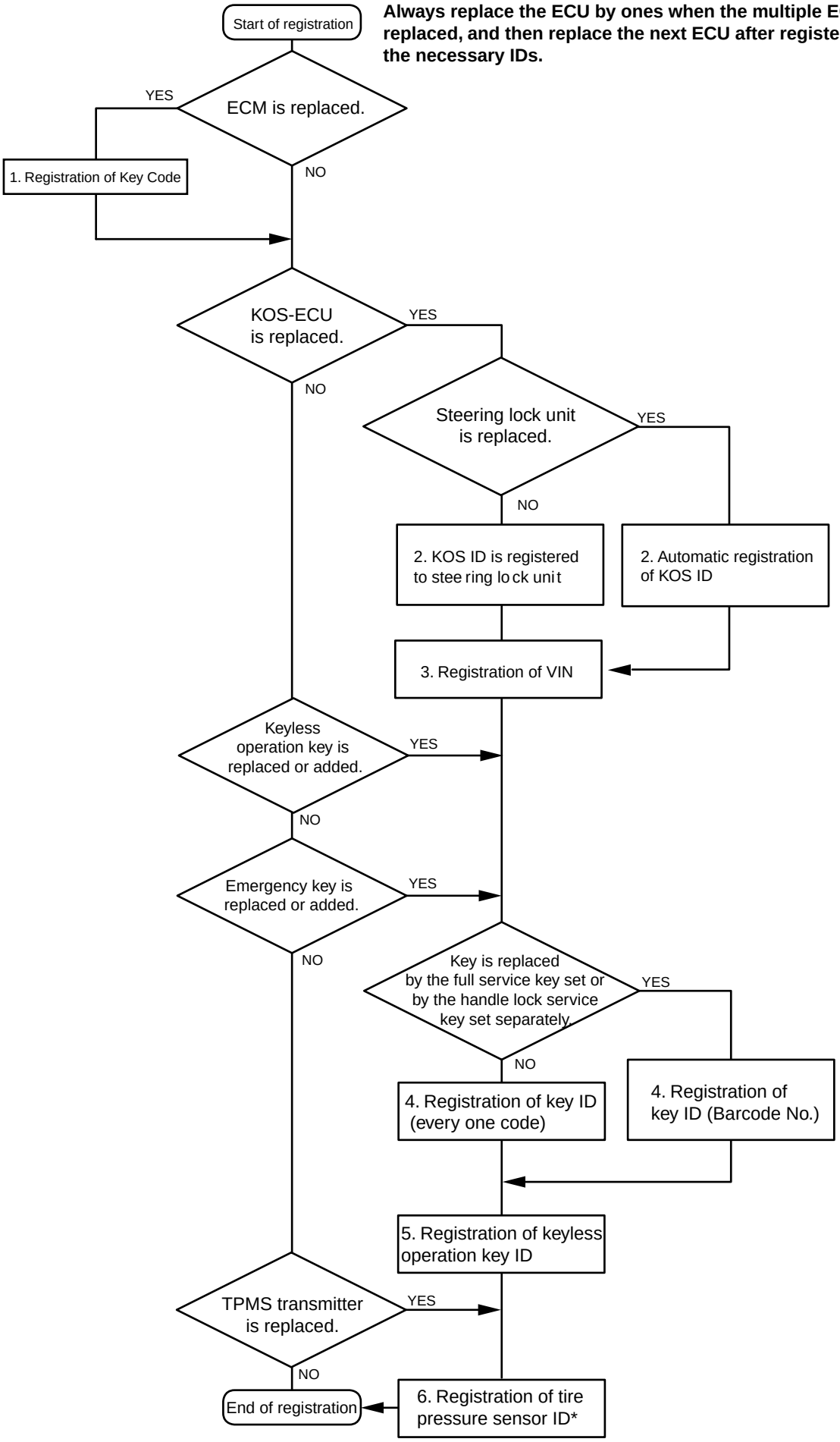
Emaregency key	Keyless operation key	*NOTE: Blank key (It is the key that comes with the door service key set and the glove box service key set. It can only be used for locking and unlocking, and it cannot start the engine.)*
 ZC603741	 ZC6037420000	Blank key  ZC6044010001

KEY SUPPLY UNIT LIST FOR OTHER THAN INDIVIDUAL KEY

Service key assembly	Full service key set	Handle lock service key set	Door service key set	Glove box service key key set
 ZC6045520000	 ZC6045410000	 ZC6045510000	 ZC6045500000	 ZC6045390000

Registration flow chart

Caution:
Do not replace the ECM and the KOS-ECU simultaneously. Always replace the ECU by ones when the multiple ECU is replaced, and then replace the next ECU after registering the necessary IDs.

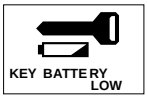


NOTE

WARNING AND WARNING INDICATOR LIST

M14209100149USA0000010000

When KOS or TPMS failed or operated improperly, KOS-ECU warns the driver of this by setting off the outer tone alarm, the keyless operation warning indicator or on the multi information display in the combination meter, or the TPMS warning indicator.

Display contents	Item	State	Warning operations	Warning cancellation conditions (Cancels warning operations when one of the conditions met)
 ZC6037450000	Low keyless operation key battery voltage warning	The keyless operation key with low battery voltage is detected when the IG knob is pressed.	▪Warning indicator flashes for 30 seconds. ▪The outer tone alarm will not sound.	▪IG knob in "LOCK" (OFF) position and push switch OFF are detected. ▪30 seconds have passed after the warning output started.
 ZC6037460000	No keyless operation key detected inside the car	No keyless operation key is detected inside the car when the IG knob is pressed.	▪The warning indicator flashes for 5 minutes. ▪The outer tone alarm will not sound.	▪IG knob in "LOCK" (OFF) position and push switch OFF are detected. ▪5 minutes have passed after the warning output started.
 ZC6037440000	IG knob is not returned properly.	Opening of the driver's door is detected when the IG knob is in ACC or LOCK position and the push switch is ON.	▪The warning indicator flashes for 5 minutes. ▪The outer tone alarm will not sound. ▪Key reminder warning tone alarm sounds until closing of the driver's door is detected.	▪The IG knob in the "RUN" or "START" position, or the IG knob in the "LOCK" (OFF) position, and the push switch OFF are detected. ▪The driver's door is detected closed from the open position. ▪5 minutes have passed after the warning output started.
 ZC6037470000	Keyless operation key carrying-out warning	The keyless operation key is carried out of the vehicle when the IG knob is in other than the LOCK position.	▪The warning indicator flashes for 5 minutes. ▪Outer tone alarm sounds for 5.69 seconds in pattern 2.	▪IG knob in LOCK position and push switch OFF are detected. ▪KOS-ECU has detected a keyless operation key inside the vehicle. ▪5 minutes have passed after the warning output started.

Display contents	Item	State	Warning operations	Warning cancellation conditions (Cancels warning operations when one of the conditions met)
 ZC6037480000	Door lock does not operate.	Push switch is pressed ON when the IG knob is in other than LOCK position.	▪Warning indicator flashes for 5 seconds. ▪Outer tone alarm sounds for 2.96 seconds in pattern 1.	▪IG knob in "LOCK" (OFF) position and push switch OFF are detected. ▪5 seconds have passed after the warning output started.
		Push switch is pressed ON when the keyless operation key is inside the car.		▪Lock switch on the keyless operation switch is pressed again. ▪5 seconds have passed after the warning output started.
		Push switch is pressed ON when the door is ajar.		▪All doors are closed. ▪5 seconds have passed after the warning output started.
 ZC6022600000	System error	Push switch is pressed ON from OFF when an error has been detected in EEPROM in KOS-ECU.	▪The warning indicator flashes for 5 minutes. ▪The outer tone alarm will not sound.	5 minutes have passed after the push switch was pressed ON and IG knob is in "LOCK" (OFF) position.
		Push switch is pressed ON from OFF while open circuit in the transmitter antennas are being detected.		
		The push switch is pressed ON from OFF while short circuit in the power supply output (steering lock, transmitter antennas, receiver antenna module, etc.) is detected.		
		Steering lock communication error has been detected when the push switch was pressed ON.		

Display contents	Item	State	Warning operations	Warning cancellation conditions (Cancels warning operations when one of the conditions met)
		The IG knob is in other than the LOCK position while some error is being detected.		
a  ZC6037100000	Tire pressure alarm	The received tire pressure value is under the threshold value.	▪The indicator illuminates until it receives the normal tire pressure value. ▪The outer tone alarm will not sound.	The received tire pressure value is over the threshold value.
b  ZC6037110000	TPMS alarm	Abnormality of data is detected.	▪The indicator illuminates until the abnormality of the data is recovered. ▪The outer tone alarm will not sound.	Normality is confirmed.
		When the tire judgment* is performed 5 times or more continuously, for every time during the period, one or more IDs of tires with pressure under the specified value are received.	▪The indicator illuminates until all the IDs of tires with over the specified value are normally received. ▪The outer tone alarm will not sound.	All the IDs of tires with pressure over the specified value are normally received.
		The low battery function code is continuously received.	▪The indicator illuminates until the normal pressure function code is continuously received. ▪The outer tone alarm will not sound.	The normal pressure function code is continuously received.

Display contents	Item	State	Warning operations	Warning cancellation conditions (Cancels warning operations when one of the conditions met)
		With the ignition switch "ON," while the wake function code is received for the specified times, when the vehicle speed signal is always under 5 km/h (3.1 mph/h)	▪With the ignition switch "ON," the indicator illuminates until the vehicle speed of 5 km/h (3.1 mph/h) or more is kept for 1 second or longer. ▪The outer tone alarm will not sound.	With the ignition switch "ON," the vehicle speed of 5 km/h (3.1 mph/h) or more is kept for 1 second or longer.
	TPMS alarm	Abnormality of data is detected.	▪The indicator illuminates until the abnormality of the data is recovered. ▪The outer tone alarm will not sound.	Normality is confirmed.

NOTE: When the vehicle speed exceeds 30 km/h (18.6 mph/h) for more than 35 seconds, the signals received from the TPMS transmitter shall be checked for 15 minutes. During that 15 minutes of reception check, when the specified value of a tire is normally received, the tire is judged as the road wheel. After the 15 minuses of measurement, if four tires are judged as the road wheels, the remaining wheel is judged as the spare tire. After the 15 minuses of measurement, if three or less tires are judged as the road wheels, the result of last measurement will be applied for the unjudged tire(s).

DIAGNOSTIC TROUBLE CODE CHART

M142091000002USA0000010001

⚠ CAUTION

During diagnosis, a DTC associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, check all systems for diagnostic trouble code(s). If DTC(s) are set, erase them all.

Diagnostic trouble code number	Diagnostic item	Reference page
B1731	Engine control module communication timeout	P.42B-21
B1761	VIN not programmed	P.42B-23
B1A08	Keyless/KOS key1 performance	P.42B-24
B1A09	Keyless/KOS key2 performance	
B1A0A	Keyless/KOS key3 performance	
B1A0B	Keyless/KOS key4 performance	
B1A10	Keyless/KOS key 1 low battery	P.42B-25

Diagnostic trouble code number	Diagnostic item	Reference page
B1A11	Keyless/KOS key 2 low battery	
B1A12	Keyless/KOS key 3 low battery	
B1A13	Keyless/KOS key 4 low battery	
B1A24	Key ID not registered	P.42B-26
B1A25	Key ID unmatched	P.42B-27
B1A28	Engine control module authenticate error	P.42B-29
B1A35	Transponder read error	P.42B-30
B2101	IG SW start POS.circuit low	P.42B-32
B2102	IG SW start POS.circuit high	
B2204	Coding data mismatch	P.42B-36
B2206	VIN mismatch	P.42B-38
B2352	Antenna fail	P.42B-39
B2400	KOS key registration fail	P.42B-42
B2401	Keyless/KOS key ID not registered	P.42B-43
B2402	STL unit comm.(system ID)	P.42B-45
B2403	STL unit comm.(CRC)	
B2404	STL unit comm.(function code)	
B2405	STL unit comm.(rolling code)	
B2406	STL unit comm.(PTC operate)	
B2407	STL unit comm.(EEPROM)	
B2408	STL unit comm.(solenoid)	
B2409	STL unit comm.(No response)	P.42B-47
B240A	FR antenna(outdoor) open	P.42B-50
B240B	FL antenna(outdoor) open	P.42B-52
B240C	Liftgate antenna(outdoor) open	P.42B-55
B240D	Front antenna(indoor) open	P.42B-57
B240E	RR antenna(indoor) open	P.42B-59
B240F	RL antenna(indoor) open	P.42B-62
B2412	LF antenna power voltage	P.42B-64
B2413	STL unit power voltage	P.42B-68
B2414	Unlock sensor fail	P.42B-72
B2415	RA module power voltage	P.42B-75
B2416	ECU internal error	P.42B-77
C1608	EEPROM error	P.42B-78
C1900	No registration	P.42B-79
C1901	Vehicle speed information abnormality	P.42B-81
C1910	Transmitter low battery voltage abnormality 1	P.42B-82
C1920	Transmitter low battery voltage abnormality 2	

Diagnostic trouble code number	Diagnostic item	Reference page
C1930	Transmitter low battery voltage abnormality 3	
C1940	Transmitter low battery voltage abnormality 4	
C1911	Reception abnormality 1	P.42B-84
C1921	Reception abnormality 2	
C1931	Reception abnormality 3	
C1941	Reception abnormality 4	
C1912	Tire inflation pressure warning 1	P.42B-85
C1922	Tire inflation pressure warning 2	
C1932	Tire inflation pressure warning 3	
C1942	Tire inflation pressure warning 4	
C1913	Acceleration sensor abnormality 1	P.42B-87
C1923	Acceleration sensor abnormality 2	
C1933	Acceleration sensor abnormality 3	
C1943	Acceleration sensor abnormality 4	
C1914	Pressure sensor abnormality 1	P.42B-88
C1924	Pressure sensor abnormality 2	
C1934	Pressure sensor abnormality 3	
C1944	Pressure sensor abnormality 4	
U0019	Bus off (CAN-B)	P.42B-90
U0141	ETACS-ECU CAN timeout	P.42B-91
U0151	SRS-ECU CAN timeout	P.42B-93
U0154	Occupant classification-ECU CAN timeout	P.42B-94
U0155	Combination meter CAN timeout	P.42B-96
U0164	A/C-ECU CAN timeout	P.42B-97
U0184	Audio CAN timeout	P.42B-99
U0197	Hands free module CAN timeout	P.42B-100
U0245	Audio visual navigation unit CAN timeout	P.42B-102
U1412	Implausible Vehicle Speed Signal Received	P.42B-103
U1415	Coding not completed/Data fail	P.42B-104
U1417	Implausible coding data	P.42B-106

NOTE:

*"*1: STL unit = steering lock unit*

*"*2: RA module = receiver antenna module*

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC B1731: Engine Control Module communication timeout

M14209100004USA0000010000

⚠ CAUTION

- **When the DTC B1731 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DTC SET CONDITION

KOS-ECU checks that the Engine Control Module data has been received via the CAN bus lines, and if not, sets the DTC No. B1731.

TECHNICAL DESCRIPTION (COMMENT)

If no data [ETACS transmits engine random number data to KOS-ECU via the CAN bus lines] is received from the Engine Control Module via the CAN bus lines when the ignition switch is turned to ON position, it is judged as abnormal.

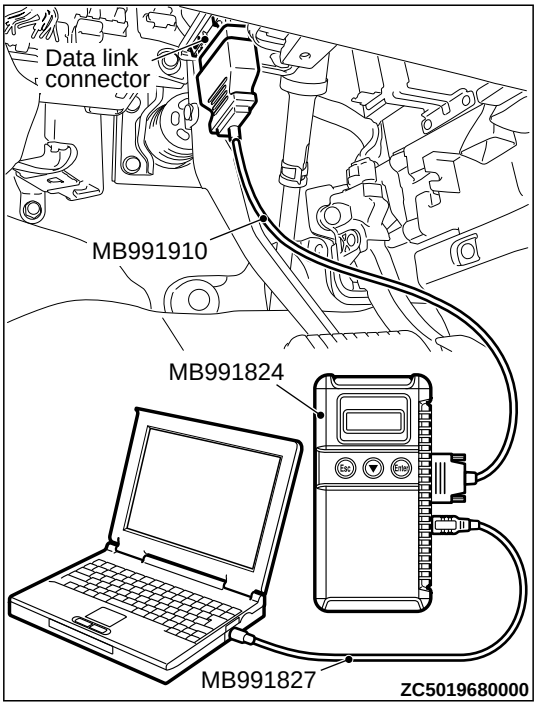
TROUBLESHOOTING HINTS

- Malfunction of CAN bus line
- Malfunction of KOS-ECU
- Malfunction of engine control module
- Malfunction of ETACS-ECU

DIAGNOSIS

Required Special Tools:

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



STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the Engine Control Module diagnostic trouble code

Check again if the DTC is set to the engine control module.

Q:Is the DTC set?

YES: Troubleshoot the MFI system (Refer to GROUP 13Ab, Diagnostic trouble code chart P.13Ab-44).
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.) After registering the ID codes, go to Step 4.
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Recheck for diagnostic trouble code.

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

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

Q:Is the DTC set?
YES: Replace the engine control module and record the VIN. (Refer to GROUP 00 - How To Perform Vehicle Identification Number (VIN) Writing P.00-26.)
NO: The procedure is complete.

DTC B1761: VIN not programmed

M14209100005USA0000010000

⚠ CAUTION
- **When the DTC No. B1761 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DTC SET CONDITION
KOS-ECU sets DTC B1761 when no VIN is recorded in it.

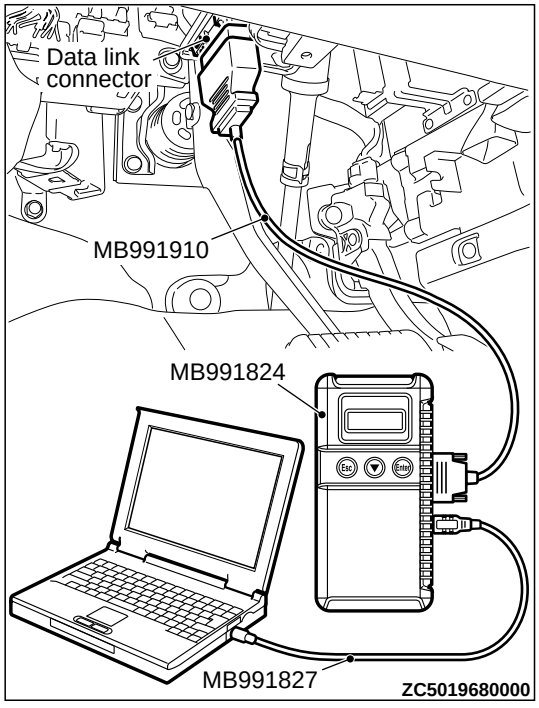
TECHNICAL DESCRIPTION (COMMENT)
KOS-ECU determines that the abnormality is present when no VIN is recorded in it.

TROUBLESHOOTING HINTS
- VIN not programmed
- Malfunction of the KOS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Register the VIN and recheck the diagnostic trouble code.
Register VIN in KOS-ECU (Refer to GROUP 00 - How to Perform Vehicle Identification Number (VIN) Writing P.00-26) and recheck if the DTC is set.
(1) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
(2) Check if DTC is set.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B1A08 Keyless/KOS key1 performance
DTC B1A09 Keyless/KOS key2 performance
DTC B1A0A Keyless/KOS key3 performance
DTC B1A0B Keyless/KOS key4 performance

M14209100123USA0000010000

⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

DTC SET CONDITION
The mechanism which automatically changes a code for lock/unlock each time a lock operation is performed is referred to as a rolling code. If KOS-ECU receives wrong signal (out of synchronisation of a rolling code) from the keyless operation key, KOS-ECU memorises the DTC B1A08.

TECHNICAL DESCRIPTION (COMMENT)
- B1A08: If the difference between the rolling code for the keyless operation key 1 (the first keyless operation key registered with KOS-ECU) and that memorised by KOS-ECU is large, it is judged as abnormal.
- B1A09: If the difference between the rolling code for the keyless operation key 2 (the second keyless operation key registered with KOS-ECU) and that memorised by KOS-ECU is large, it is judged as abnormal.
- B1A0A: If the difference between the rolling code for the keyless operation key 3 (the third keyless operation key registered with KOS-ECU) and that memorised by KOS-ECU is large, it is judged as abnormal.
- B1A0B: If the difference between the rolling code for the keyless operation key 4 (the fourth keyless operation key registered with KOS-ECU) and that memorised by KOS-ECU is large, it is judged as abnormal.

TROUBLESHOOTING HINTS
- Rolling code out of synchronisation
- Malfunction of the keyless operation key
- Malfunction of the KOS-ECU

DIAGNOSIS

STEP 1. Synchronise the rolling code and recheck the diagnostic trouble code.
Synchronise the rolling codes, and check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Press the lock or unlock switch of the keyless operation key for which the DTC is set at least once to synchronise the rolling codes.
(4) Check if the DTC is set.

Q:Is the DTC set?
YES: Go to Step 2.
NO: The procedure is complete.

STEP 2. Check whether the diagnostic trouble code is reset.
Replace the keyless operation key for which the DTC is set with a new one, register the encrypted code and keyless operation key ID (refer to P.42B-12), and check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B1A10 Keyless/KOS key 1 low battery
DTC B1A11 Keyless/KOS key 2 low battery
DTC B1A12 Keyless/KOS key 3 low battery
DTC B1A13 Keyless/KOS key 4 low battery

M14209100124USA0000010000

⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

DTC SET CONDITION
If KOS-ECU receives the keyless operation key low battery voltage signal, KOS-ECU sets the DTC B1A10, B1A11, B1A12, or B1A13.

TECHNICAL DESCRIPTION (COMMENT)
- B1A10: If KOS-ECU receives the keyless operation key 1 (the first keyless operation key registered with KOS-ECU) low battery voltage signal in five consecutive times, it is judged as abnormal.
- B1A11: If KOS-ECU receives the keyless operation key 2 (the second keyless operation key registered with KOS-ECU) low battery voltage signal in five consecutive times, it is judged as abnormal.
- B1A12: If KOS-ECU receives the keyless operation key 3 (the third keyless operation key registered with KOS-ECU) low battery voltage signal in five consecutive times, it is judged as abnormal.
- B1A13: If KOS-ECU receives the keyless operation key 4 (the fourth keyless operation key registered with KOS-ECU) low battery voltage signal in five consecutive times, it is judged as abnormal.

TROUBLESHOOTING HINTS
- Malfunction of the keyless operation key battery
- Malfunction of the keyless operation key
- Malfunction of KOS-ECU

DIAGNOSIS

STEP 1. Replace the battery in the keyless operation key and recheck the diagnostic trouble code.
Replace the battery of the keyless operation key for which the DTC is set, and check whether the DTC is reset.
(1) Replace the battery of the keyless operation key for which the DTC is set.
(2) Erase the DTC.
(3) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(4) Lock or unlock the keyless operation key.
(5) Check if the DTC is set.

Q:Is the DTC set?
YES: Go to Step 2.
NO: The procedure is complete. (Discharged battery)

STEP 2. Replace the keyless operation key and recheck the diagnostic trouble code.
Replace the keyless operation key for which the DTC is set with a new one, register the encrypted code and keyless operation key ID (refer to P.42B-12), and check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The procedure is complete.

DTC B1A24: Key ID not registered

M14209100089USA0000010000

DTC SET CONDITION
KOS-ECU sets the DTC B1A24 when the key ID was not registered in it.

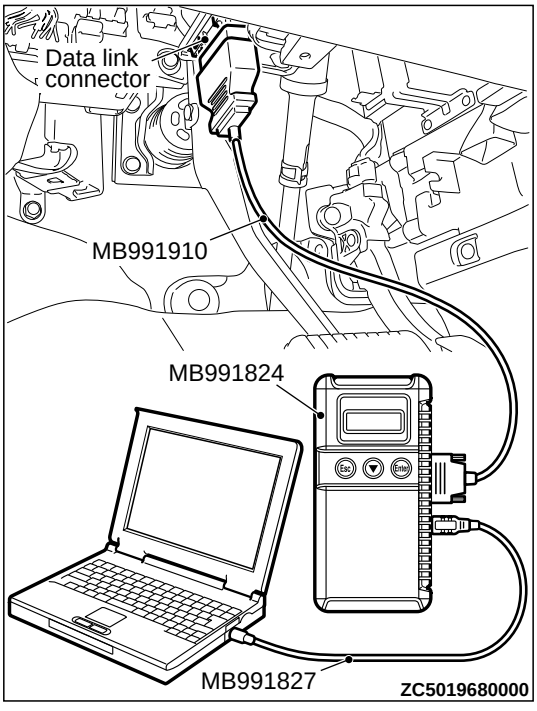
TECHNICAL DESCRIPTION (COMMENT)
KOS-ECU determines that the abnormality is present, if the key ID is not registered in it when the ignition switch is turned ON.

ROUBLESHOOTING HINTS
- Key ID not registered
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Register the key ID and recheck the diagnostic trouble code.

Register the key ID of the emergency key by which the DTC is set (refer to P.42B-163), and recheck if the DTC is set.

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

Q:Is the diagnostic trouble code set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B1A25: Key ID unmatched

M14209100090USA0000010000

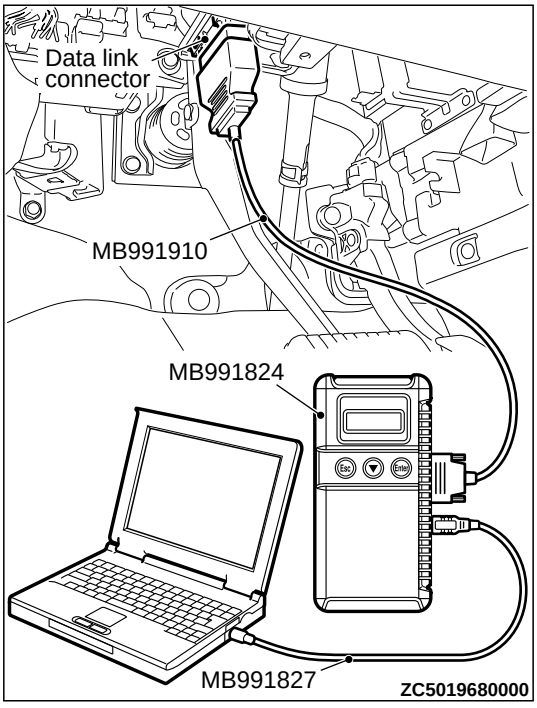
DTC SET CONDITION
KOS-ECU sets the DTC B1A25 when the received key ID is different from the one registered in it.

TECHNICAL DESCRIPTION (COMMENT)
KOS-ECU determines that the abnormality is present, if the transponder ID does not match the one registered in it when the ignition switch is turned ON.

TROUBLESHOOTING HINTS
- Malfunction of the emergency key
- Accessory key not registered
- Accessory KOS-ECU not registered
- Key is registered to another vehicle
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Register the key ID and recheck the diagnostic trouble code.

Register the key ID of the emergency key by which the DTC is set (refer to P.42B-163), and recheck if the DTC is set.

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

Q:Is the DTC set?

YES: Go to Step 3.
NO: The procedure is complete.

STEP 3. Replace the emergency key and recheck the diagnostric trouble code.

Replace the emergency key for which the DTC is set with a new one, register the key ID and keyless operation key ID (refer to P.42B-12), and check whether the DTC is reset.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B1A28: Engine control module authenticate error

M142091000091USA0000010000

⚠ CAUTION

- **When the DTC B1A28 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DTC SET CONDITION

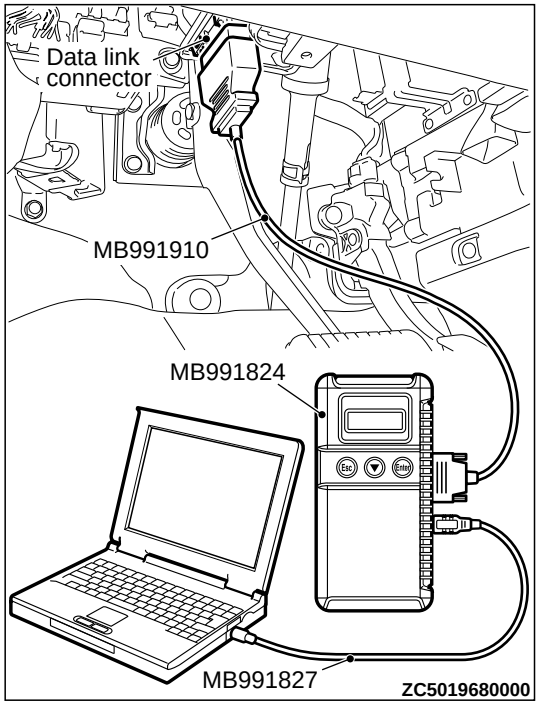
If the key certification result by KOS-ECU does not match with the engine control module status, KOS-ECU sets the DTC B1A28.

TECHNICAL DESCRIPTION (COMMENT)

KOS-ECU determines that the abnormality is present, if the key certification result and the engine control module status do not match after the engine start permission communication is completed.

TROUBLESHOOTING HINTS

- Malfunction of KOS-ECU
- Engine control module malfunction
- VIN registered in engine control module unmatched



DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Check the VIN registered in the engine control module and the vehicle's VIN.
Check if VIN registered in the engine contyrol module matches with the vehicle's VIN.

Q:Do VIN registered in the engine control module and the vehicle's VIN match?
YES: Go to Step 3.
NO: Replace the engine control module and record the VIN. (Refer to GROUP 00 - How To Perform Vehicle Identification Number (VIN) Writing P.00-26.) After registering the VIN, go to Step 3.

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

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC B1A35: Transponder read error

M14209100092USA0000010000

⚠ CAUTION
- **When the DTC B1A35 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DTC SET CONDITION
If no transponder data can be received, KOS-ECU sets the DTC B1A35.

TECHNICAL DESCRIPTION (COMMENT)
KOS-ECU determines that the abnormality is present, if it cannot receive the key ID for the emergency key when the ignition switch is turned ON.

TROUBLESHOOTING HINTS
- Malfunction of the emergency key
- Interference of the key ID
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable

- MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Check the ignition key inserted in the key cylinder for interference.

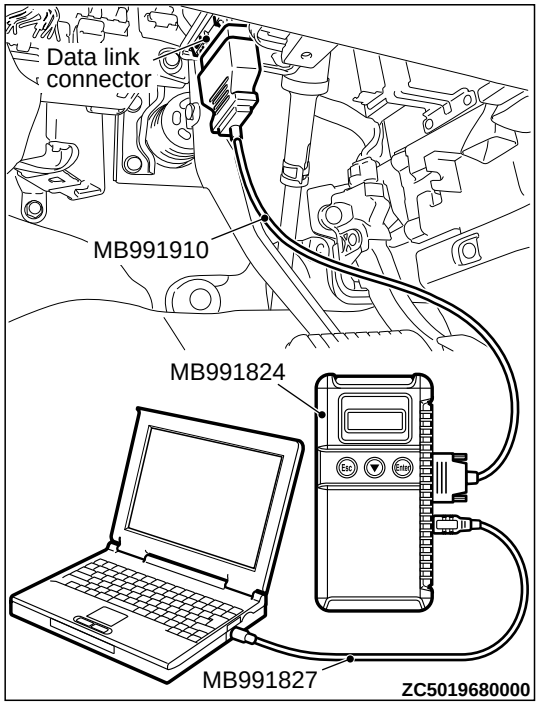
Check if there are other ignition keys or anything that interferes with the communication (things that generate radio waves such as magnets and an air-cleaning device that has a power plug) near the ignition key inserted in the key cylinder.

Q:Are there other ignition keys or anything that interferes with the communication?

YES: Move away or remove other ignition keys or anything that interferes with the communication, and go to Step 4.

NO: Go to Step 2.

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



⚠ CAUTION

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

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES: Go to Step 3.

NO: Repair the CAN bus line. (Refer to GROUP 54D, Diagnosis P.54D-17).

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Go to Step 5.

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?
YES: Go to Step 5.
NO: The procedure is complete.

STEP 5. Replace the emergency key and recheck the diagnostic trouble code.
Replace the emergency key for which the DTC is set with a new one, register the key ID and keyless operation key ID (refer to P.42B-12), and check whether the DTC is reset.
(1) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
(2) Check if the DTC is set.

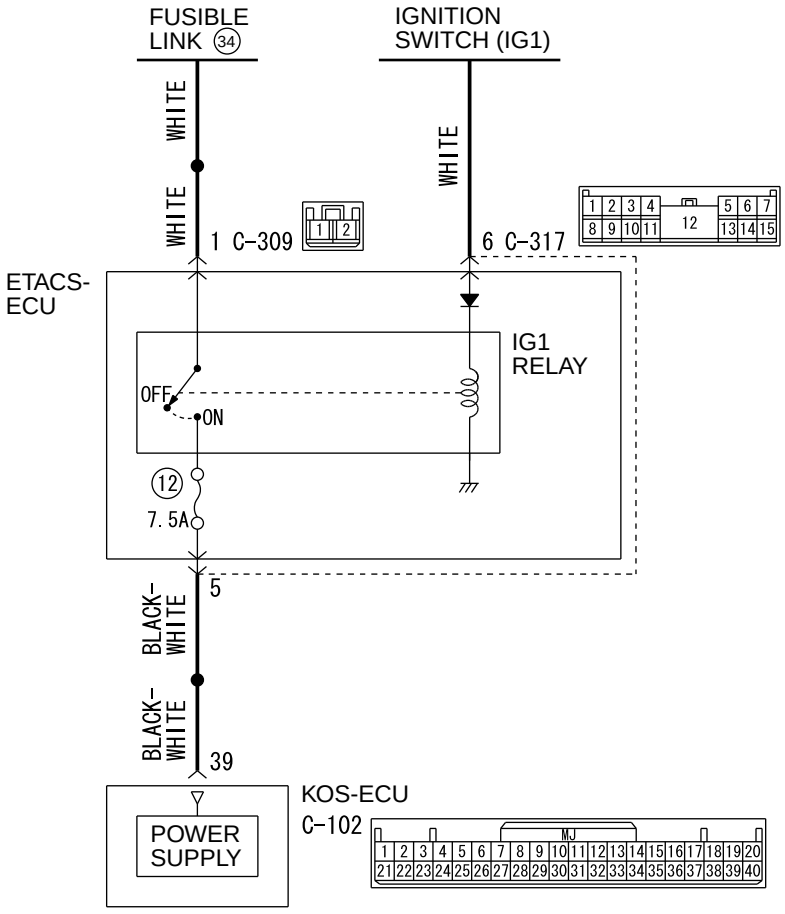
Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B2101: IG SW start POS.circuit low
DTC B2102: IG SW start POS.circuit high

M14209100096USA0000010000

CAUTION
- **If the DTC B2101 or B2102 is set in KOS-ECU, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

KOS-ECU Communication Circuit



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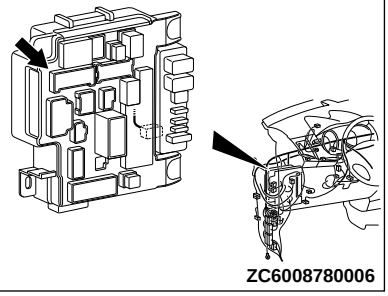
Connector: C-317



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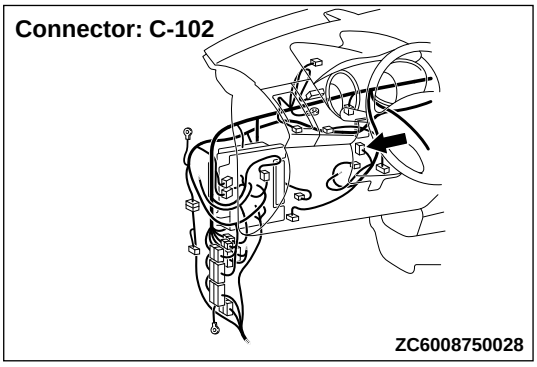


DTC SET CONDITION

If the actual ignition switch status is different from the ignition switch status information received from ETACS-ECU via CAN, KOS-ECU sets the diagnostic trouble code No. B2101 or B2102.

TECHNICAL DESCRIPTION (COMMENT)

If the difference in the ignition switch level shown below occurs consecutively 10 times with the ignition switch being the ON position or START position, when the CAN message (ignition switch position information) from ETACS-ECU, KOS-ECU determines that there is a problem.

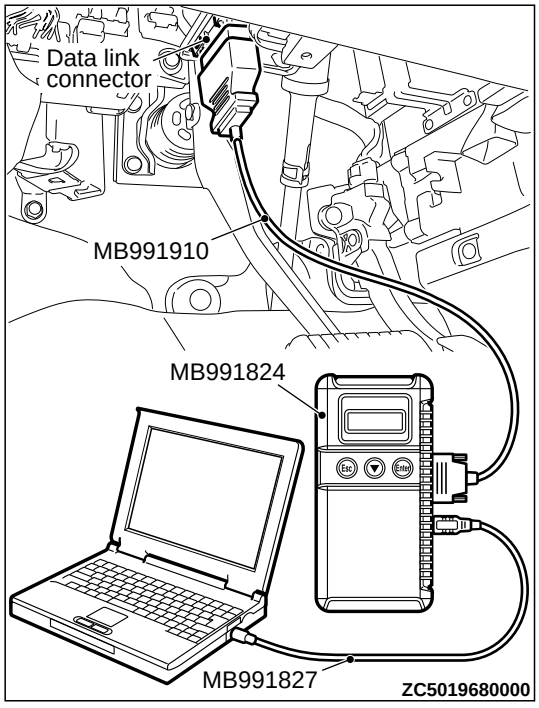
B2101
- Status of ignition switch: ON position
- Ignition switch position information: OFF

B2102
- Status of ignition switch: OFF position
- Ignition switch position information: ON

TROUBLESHOOTING HINTS
- Malfunction of CAN bus line
- Malfunction of the KOS-ECU
- Malfunction of the ignition switch
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Check ETACS-ECU connector C-317 and KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is ETACS-ECU connector C-317 and KOS-ECU connector C-102 in good condition?

YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal No.39) and ETACS-ECU connector C-317 (terminal No.5).

- Check the power supply line for open circuit.

Q:Is the wiring harness between KOS-ECU connector C-102 (terminal No. 39) and ETACS-ECU connector C-317 (terminal No. 5) in good condition?

YES: Go to Step 4.
NO: Repair the wiring harness.

STEP 4. Using scan tool MB991958, check data list.

Use the ETACS-ECU data list to check the signals related to the ignition voltage.

Item No.	Item name	Normal conditions
Item 254	IG voltage	Battery voltage

Q:Does scan tool MB991958 display the item "IG voltage" as normal condition?

YES: Go to Step 5.

NO: Diagnose the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis P.54Ad-8.

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the WCM.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC B2204: Coding data mismatch

M14209100098USA0000010000

⚠ CAUTION

- **When the DTC B2204 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DTC SET CONDITION

If the vehicle information data on the CAN bus lines is different from that registered with KOS-ECU, KOS-ECU sets the DTC B2204.

TECHNICAL DESCRIPTION (COMMENT)

KOS-ECU determines that the abnormality is present when the vehicle information registered in it does not match the vehicle information on the CAN bus lines.

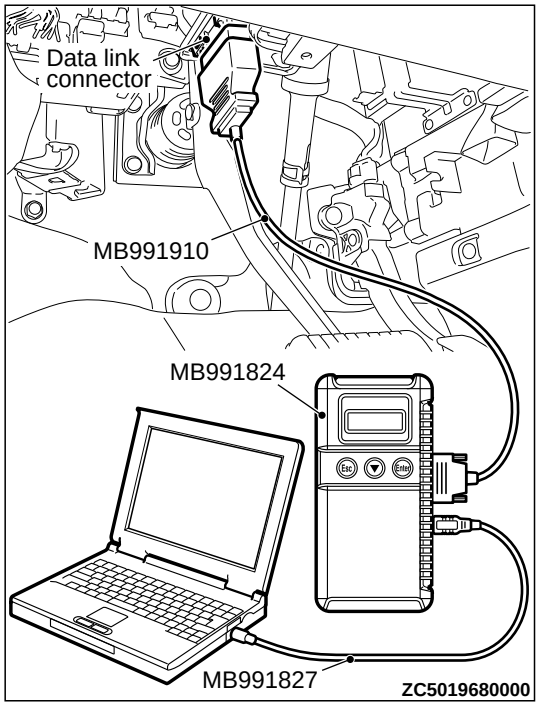
TROUBLESHOOTING HINTS

- Malfunction of KOS-ECU
- Malfunction of ETACS-ECU

DIAGNOSIS

Required Special Tools:

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



STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code

Check again if the DTC is set to the ETACS-ECU.

Q:Is the DTC set?

YES: Troubleshoot the ETACS. (Refer to GROUP 54Ad, Diagnosis P.54Ad-8.)
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC B2206: VIN mismatch

M14209100093USA0000010000

DTC SET CONDITION
KOS-ECU sets DTC B2206 when chassis number registered in it and VIN that has been transmitted on the CAN bus do not match.

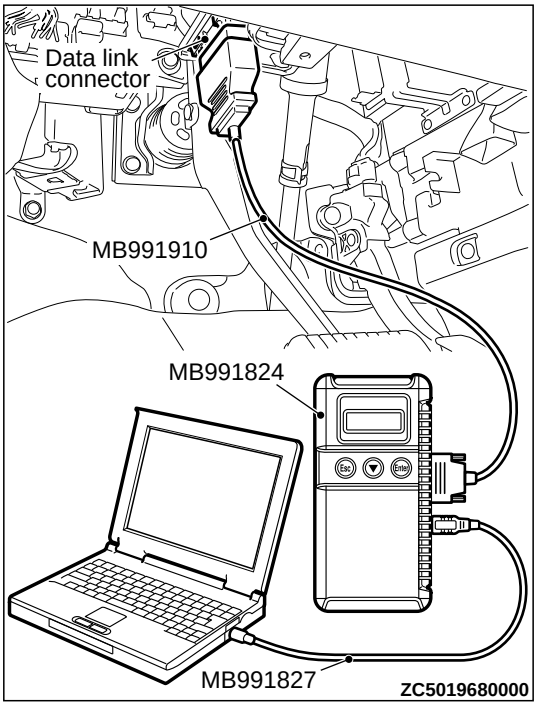
TECHNICAL DESCRIPTION (COMMENT)
KOS-ECU determines that the abnormality is present when VIN registered in it and the one that has been transmitted on the CAN bus do not match.

TROUBLESHOOTING HINTS
- Malfunction of KOS-ECU
- VIN registered in engine control module unmatched
- KOS-ECU being registered to another vehicle
- Malfunction of ETACS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17). Then go to Step2.

STEP 2. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.) After registering the ID codes, go to Step 3.
NO: The procedure is complete.

STEP 3. Recheck for diagnostic trouble code.
Check again if the DTC is set to the KOS-ECU.
(1) Turn the ignition switch to the "ON" position.
(2) Check if the DTC is set.

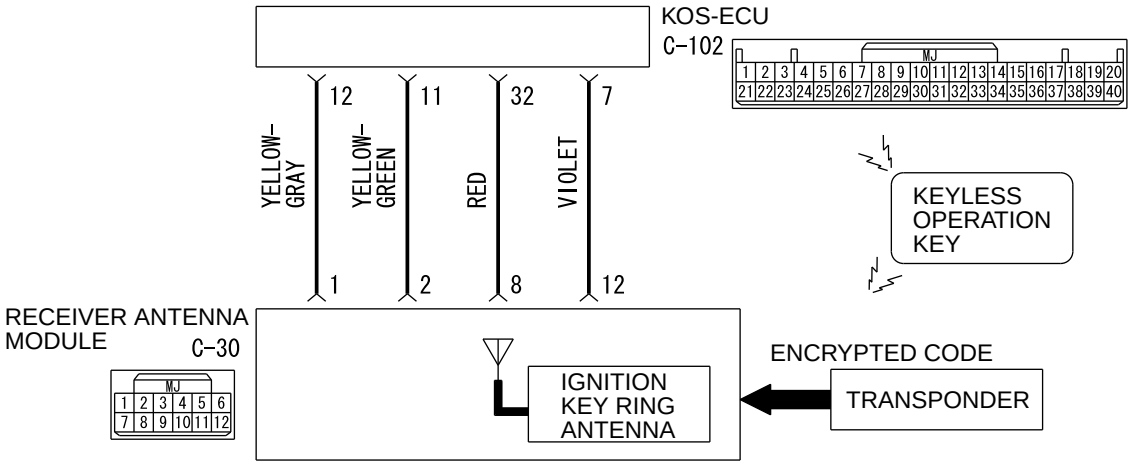
Q:Is the DTC set?
YES: Replace the engine control module and record the VIN. (Refer to GROUP 00 - How To Perform Vehicle Identification Number (VIN) Writing P.00-26.)
NO: The procedure is complete.

DTC B2352: Antenna fail

M14209100094USA0000010000

⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

Receiver Antenna Module and KOS-ECU Circuit



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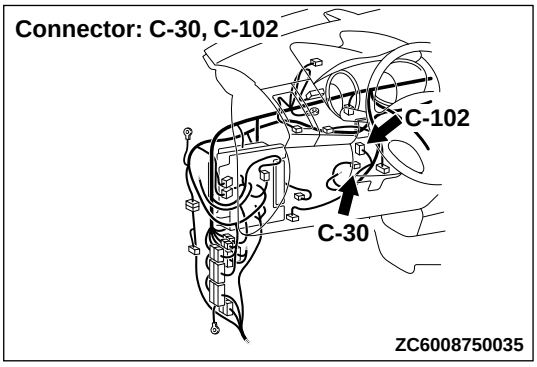


DTC SET CONDITION

If an open circuit or short to ground occurs in the antenna, KOS-ECU sets the DTC B2352.

TECHNICAL DESCRIPTION (COMMENT)

When the ignition switch is turned ON, KOS-ECU sends signals to the receiver antenna module. The receiver antenna transmits random numbers to the emergency key when it receives signals from KOS-ECU. If an open circuit or short to ground occurs on the wiring harness between KOS-ECU and receiver antenna at this time, KOS-ECU determines that there is a problem.

TROUBLESHOOTING HINTS

- Malfunction of the receiver antenna module
- Damaged wiring harness and connectors
- Malfunction of KOS-ECU

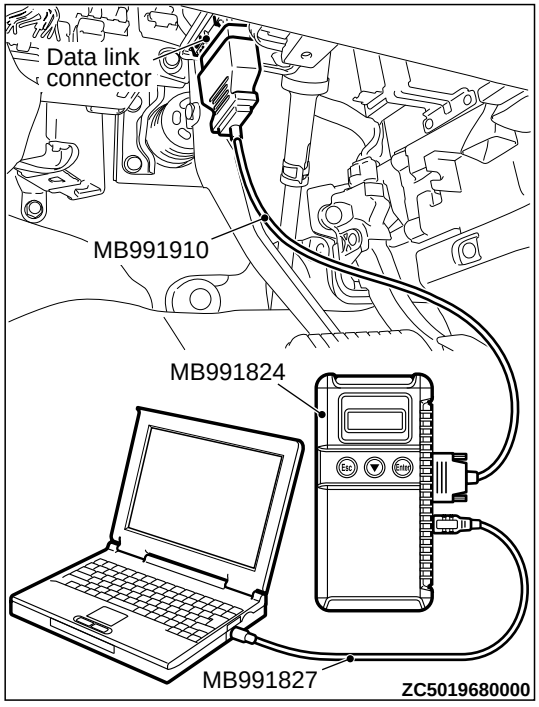
DIAGNOSIS

Required Special Tools:

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

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

Check the DTC B2415 is set to the KOS-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.

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

Q:Is the DTC B2415 is set?
YES: Refer to P.42B-75.
NO: Go to Step 2.

STEP 2. Check receiver antenna module connector C-30 and KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the receiver antenna module connector C-30 and KOS-ECU connector C-102 in good condition?
YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the wiring harness between the receiver antenna module connector C-30 (terminal No. 1, 2) and the KOS-ECU connector C-102 (terminal No. 11, 12).
▪Check the signal lines for open circuit and short circuit.

Q:Is the wiring harness between receiver antenna module connector C-30 (terminal No. 1, 2) and the KOS-ECU connector C-102 (terminal No. 11, 12) in good condition?
YES: Go to Step 4.
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.

STEP 4. Replace the receiver antenna module, and check whether the diagnostic trouble code is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
(3) Check if the DTC is set.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The procedure is complete.

DTC B2400: KOS key registration fail

M14209100014USA0000010000

⚠ CAUTION

- **If the DTC B2400 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DTC SET CONDITION

If the registration of the keyless operation key ID to KOS-ECU fails, KOS-ECU sets the DTC B2400.

TECHNICAL DESCRIPTION (COMMENT)

Assuming that another keyless operation key has already been registered with KOS-ECU, if the registration of the keyless operation key ID fails when a new keyless operation key is added or the existing key is replaced, KOS-ECU determines that there is a problem.

TROUBLESHOOTING HINTS

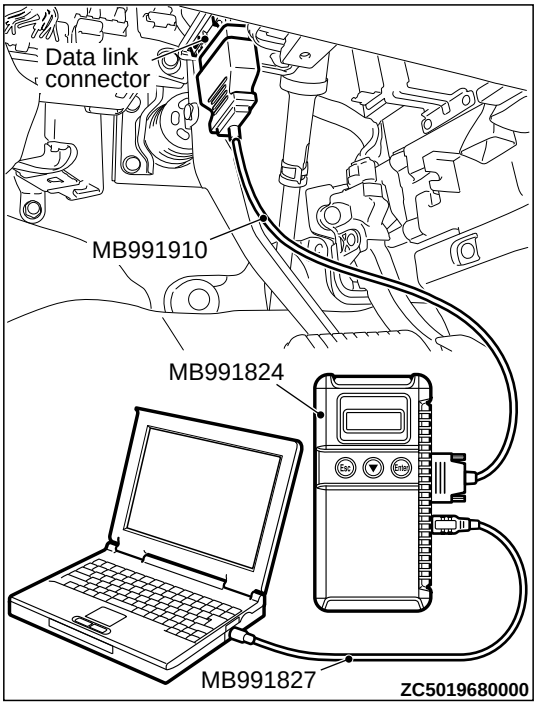
- Keyless operation key ID registration failure
- Malfunction of the keyless operation key
- Malfunction of KOS-ECU
- Malfunction of CAN bus line

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Replace the battery in the keyless operation key and recheck the diagnostic trouble code.

Replace the battery of the keyless operation key for which the DTC is set, and check whether the DTC is reset.

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

Q:Is the DTC set?

YES: Go to Step 3.
NO: The procedure is complete. (Discharged battery)

STEP 3. Replace the keyless operation key and recheck the diagnostic trouble code.

Replace the keyless operation key for which the DTC is set with a new one, register the encrypted code and keyless operation key ID (refer to P.42B-12), and check whether the DTC is reset.

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

Q:Is the diagnostic trouble code set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B2401: Keyless/KOS key ID not registered

M14209100015USA0000010000

⚠ CAUTION

- **If the DTC B2401 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If no keyless operation key ID is registered with KOS-ECU or if the keyless operation key with ID not registered is used, KOS-ECU sets the DTC B2401.

JUDGEMENT CRITERIA

If the number of the registered keyless operation keys is 0, or the registration of a keyless operation key fails when the number of the registered keyless operation keys is 0, it is judged as abnormal.

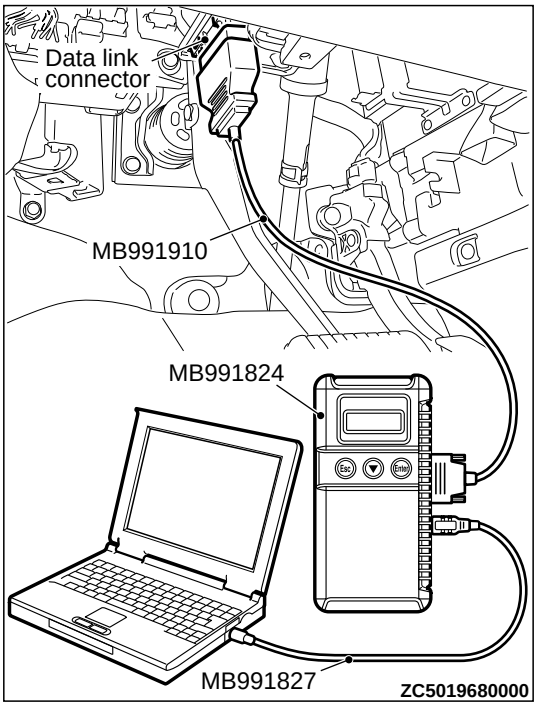
PROBABLE CAUSES

- The registration of a keyless operation key ID fails when no keyless operation key ID is registered.
- Malfunction of the keyless operation key
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable



- MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Register the keyless operation key ID and recheck the diagnostic trouble code.

Register the keyless operation key ID (refer to P.42B-163), and check whether the DTC is reset.

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

Q:Is the DTC set?

YES: Go to Step 3.
NO: The procedure is complete.

STEP 3. Replace the keyless operation key and recheck the diagnostic trouble code.

Replace the keyless operation key for which the DTC is set with a new one, register the encrypted code and keyless operation key ID (refer to P.42B-12), and check whether the DTC is reset.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The procedure is complete.

DTC B2402: STL unit comm.(system ID), B2403: STL unit comm.(CRC), B2404: STL unit comm.(function code), B2405: STL unit comm.(rolling code), B2406: STL unit comm.(PTC operate), B2407: STL unit comm.(EEPROM), B2408: STL unit comm.(solenoid)

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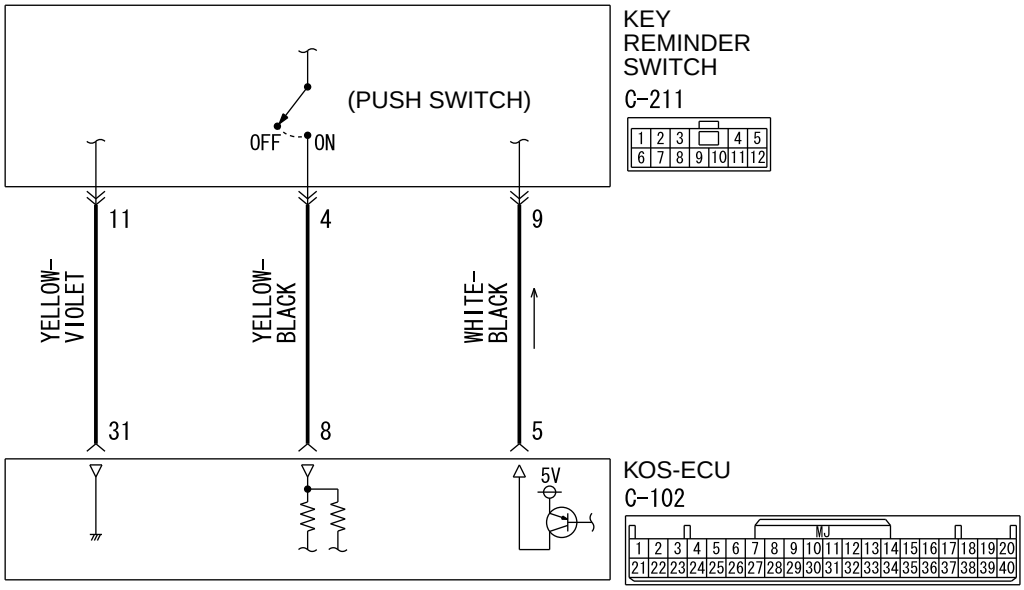
⚠ CAUTION

- **If the DTC B2402, B2403, B2404, B2405, B2406, B2407, or B2408 is set, diagnose the CAN bus lines.**
- **Whenever the steering lock unit is replaced, ensure that the communication circuit is normal.**

Key Reminder Switch and KOS-ECU Circuit



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DTC SET CONDITION

When the ignition push switch is pressed, the steering lock unit communicates with KOS-ECU to unlock the IG knob. However, if there is a failure shown below, the corresponding DTC is set.

- B2402: System ID (vehicle specific code) failure
- B2403: Cyclic Redundancy Check (CRC): The error detection strategy to detect a continuously occurring error (burst error), the calculation result discrepancy
- B2404: Function code failure
- B2405: Rolling code (automatically changing a code for lock/unlock each time when a lock operation is performed)
- B2406: PTC thermistor continuously activated or activated to prevent solenoid abnormal heating on the communication with steering lock unit
- B2407: EEPROM failure
- B2408: Communication error between the steering lock unit and KOS-ECU, or solenoid failure

TECHNICAL DESCRIPTION (COMMENT)

Range of check

- When the IG knob unlock communication is performed by pressing the ignition push switch

Judgement criteria

- B2402: Steering lock unit communication error (system ID) or received system ID error
- B2403: Steering lock unit communication error (CRC) or received frame CRC calculation result discrepancy

- B2404: Steering lock unit communication error (function code) or received frame function code undefined
- B2405: Steering lock unit communication error (rolling code) or received rolling code out of the permissible range
- B2406: Steering lock unit communication error (PTC operation) or PTC thermistor activated to prevent solenoid abnormal heating
- B2407: Steering lock unit communication error (EEPROM) or RRPROM failure
- B2408: Steering lock unit communication error (solenoid) or solenoid failure

TROUBLESHOOTING HINTS

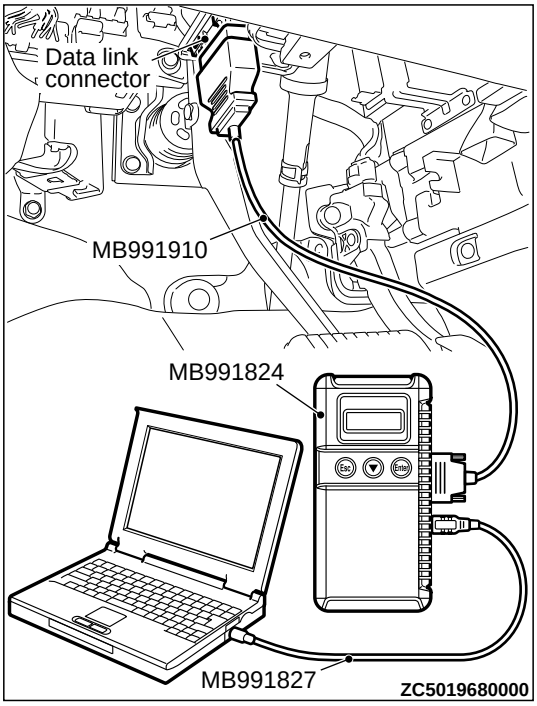
- Malfunction of the key reminder switch (integrated into the steering lock unit)
- Wiring harness or connector failure of CAN bus line
- Malfunction of the KOS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Check key reminder switch connector C-211 and KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the key reminder switch connector C-211 and KOS-ECU connector C-102 in good condition?

YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the wiring harness between the key reminder switch connector C-211 (terminal No. 4, 9) and the KOS-ECU connector C-102 (terminal No. 8, 5).

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

Q:Is the wiring harness between key reminder switch connector C-211 (terminal No. 4, 9) and the KOS-ECU connector C-102 (terminal No. 8, 5) in good condition?

YES: Go to Step 4.

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.

STEP 4. Replace the key reminder switch, and check whether the diagnostic trouble code is reset.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC B2409: STL unit comm.(No response)

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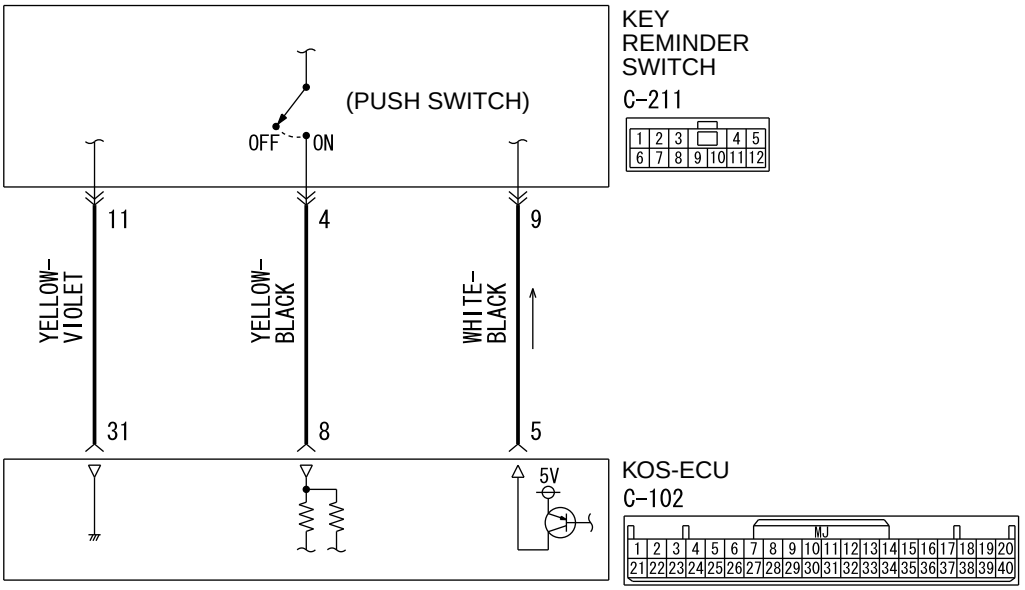
CAUTION

- **If the DTC B2409 is set, diagnose the CAN bus lines.**
- **Whenever the steering lock unit is replaced, ensure that the communication circuit is normal.**

Key Reminder Switch and KOS-ECU Circuit



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DTC SET CONDITION

When the ignition push switch is pressed, the steering lock unit communicates with KOS-ECU to unlock the IG knob. If the steering lock unit communication error (no response) occurs at this time, the DTC is set.

TECHNICAL DESCRIPTION (COMMENT)

When the IG knob unlock communication is performed by pressing the ignition push switch, if the steering lock unit communication error (no response) occurs, the steering lock unit is judged as abnormal.

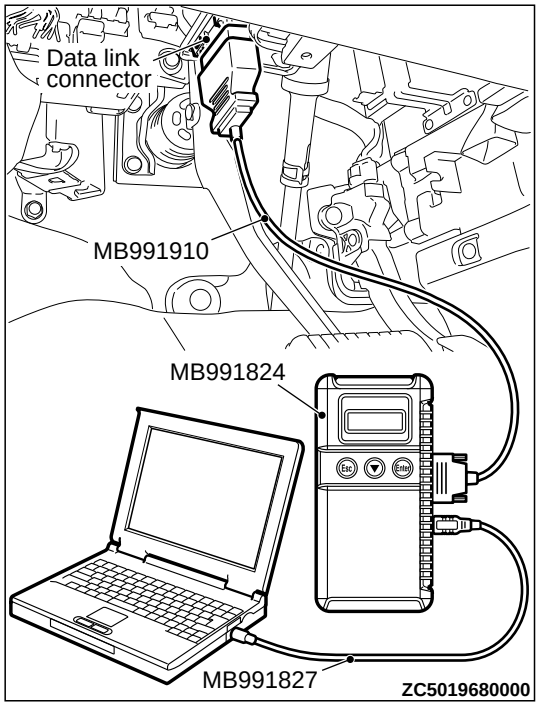
TROUBLESHOOTING HINTS

- Malfunction of the key reminder switch (integrated into the steering lock unit)
- Wiring harness or connector failure of CAN bus line
- Malfunction of the KOS-ECU

DIAGNOSIS

Required Special Tools:

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



STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Check key reminder switch connector C-211 and KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the key reminder switch connector C-211 and KOS-ECU connector C-102 in good condition?

YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the wiring harness between the key reminder switch connector C-211 (terminal No. 4, 9, 11) and the KOS-ECU connector C-102 (terminal No. 8, 5, 31).

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

Q:Is the wiring harness between key reminder switch connector C-211 (terminal No. 4, 9, 11) and the KOS-ECU connector C-102 (terminal No. 8, 5, 31) in good condition?

YES: Go to Step 4.
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.

STEP 4. Replace the key reminder switch, and check whether the diagnostic trouble code is reset.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

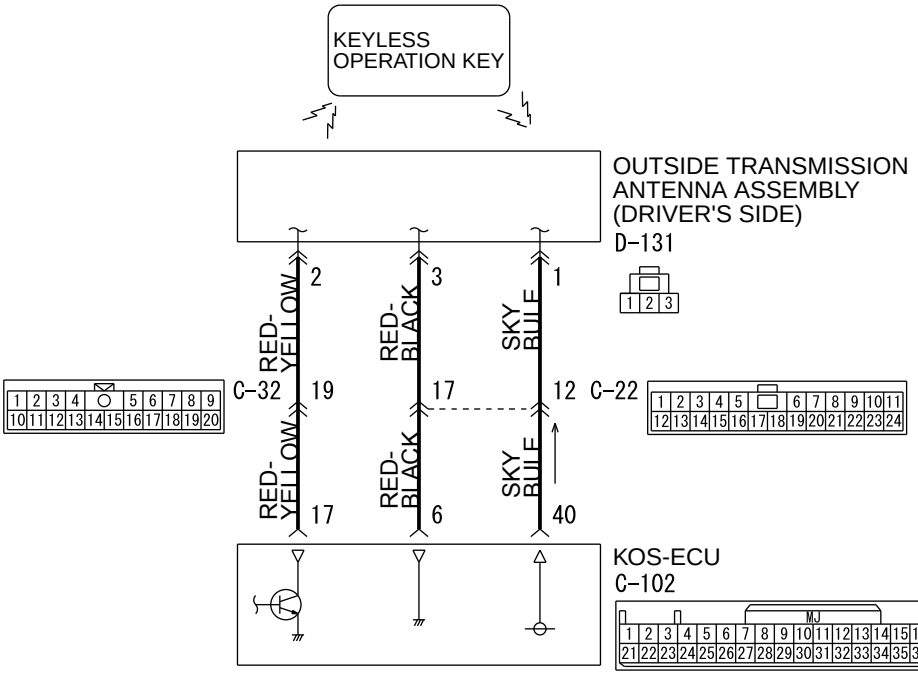
DTC B240A FR antenna(outdoor) open

M14209100024USA0000010000

⚠ CAUTION

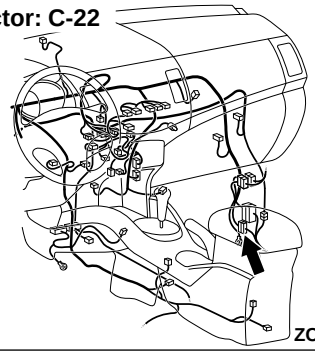
When replacing the ECU, always check that the communication circuit is normal.

Outside Transmission Antenna Assembly (Driver's Side) Circuit



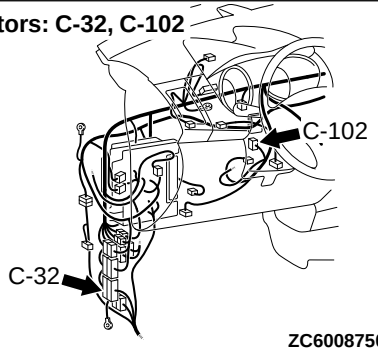
ZC6041360000

Connector: C-22

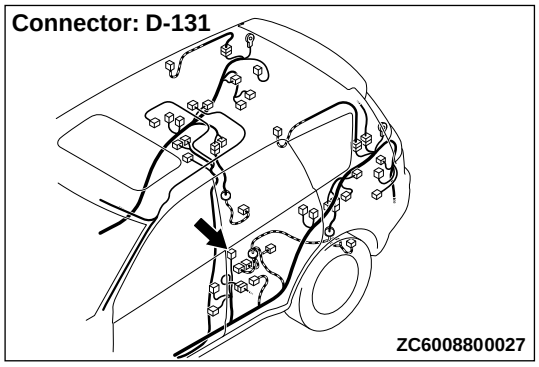


ZC6008760032

Connectors: C-32, C-102



ZC6008750030



DIAGNOSTIC FUNCTION

If an open circuit is detected in the exterior transmitter antenna (driver's side), the diagnostic trouble code is set.

JUDGEMENT CRITERIA

When the ignition push switch is pressed, or when the antenna open circuit detection request is received from the diagnosis function, the failure is detected.

PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (driver's side)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check KOS-ECU connector C-102 and exterior transmitter antenna assembly (driver's side) connector D-131 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and exterior transmitter antenna assembly (driver's side) connector D-131 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.

STEP 2. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 6, 17 and 40) and exterior transmitter antenna assembly (driver's side) connector D-131 (terminal Nos. 3, 2 and 1).

NOTE: Also check intermediate connectors C-22 and C-32 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22 and C-32 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 KOS-ECU connector C-102 (terminal Nos. 6, 17 and 40) and exterior transmitter antenna assembly (driver's side) connector D-131 (terminal Nos. 3, 2 and 1) in good condition?

YES: Go to Step 3.

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

STEP 3. Keyless operation system communication test

Check that the communication with the exterior transmitter antenna assembly (driver's side) is normal (Refer to Antenna Test P.42B-169).

Antennas to be checked

Driver side antenna (exterior)

OK: Normal is displayed.

Q:Is the check result normal?

YES: Go to Step 4.

NO: Replace the exterior transmitter antenna assembly (driver's side).

STEP 4. Check whether the diagnostic trouble code is reset.

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

Q:Is the diagnostic trouble code set?

YES: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

NO: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with Intermittent Malfunction P.00-15).

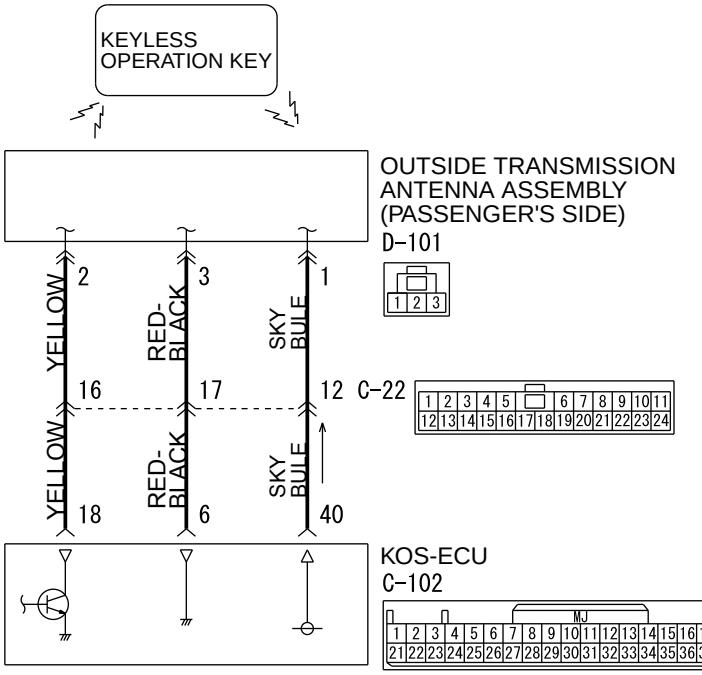
DTC B240B FL antenna(outdoor) open

M14209100025USA0000010000

⚠ CAUTION

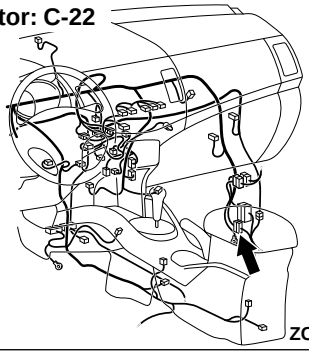
When replacing the ECU, always check that the communication circuit is normal.

Outside Transmission Antenna Assembly (Passenger's Side) Circuit



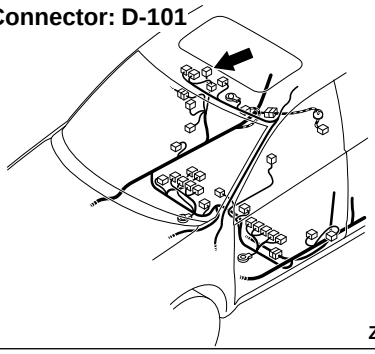
ZC6041370000

Connector: C-22



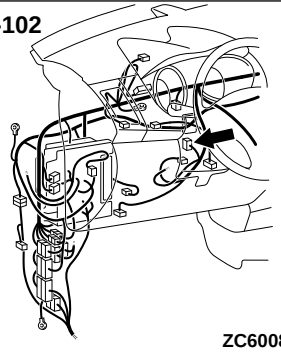
ZC6008760032

Connector: D-101



ZC6008790026

Connector: C-102



ZC6008750028

DIAGNOSTIC FUNCTION

If an open circuit is detected in the exterior transmitter antenna (passenger's side), the diagnostic trouble code is set.

JUDGEMENT CRITERIA

When the ignition push switch is pressed, or when the antenna open circuit detection request is received from the diagnosis function, the failure is detected.

PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (passenger's side)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check KOS-ECU connector C-102 and exterior transmitter antenna assembly (passenger's side) connector D-101 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and exterior transmitter antenna assembly (passenger's side) connector D-101 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.

STEP 2. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 6, 18 and 40) and exterior transmitter antenna assembly (passenger's side) connector D-101 (terminal Nos. 3, 2 and 1).

NOTE: Also check intermediate connector C-22 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22 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 KOS-ECU connector C-102 (terminal Nos. 6, 18 and 40) and exterior transmitter antenna assembly (passenger's side) connector D-101 (terminal Nos. 3, 2 and 1) in good condition?

YES: Go to Step 3.

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

STEP 3. Keyless operation system communication test

Check that the communication with the exterior transmitter antenna assembly (passenger's side) is normal (Refer to Antenna Test P.42B-169).

Antennas to be checked

passenger side antenna (exterior)

OK: Normal is displayed.

Q:Is the check result normal?

YES: Go to Step 4.

NO: Replace the exterior transmitter antenna assembly (passenger's side).

STEP 4. Check whether the diagnostic trouble code is reset.

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

Q:Is the diagnostic trouble code set?

YES: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).
NO: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with Intermittent Malfunction P.00-15).

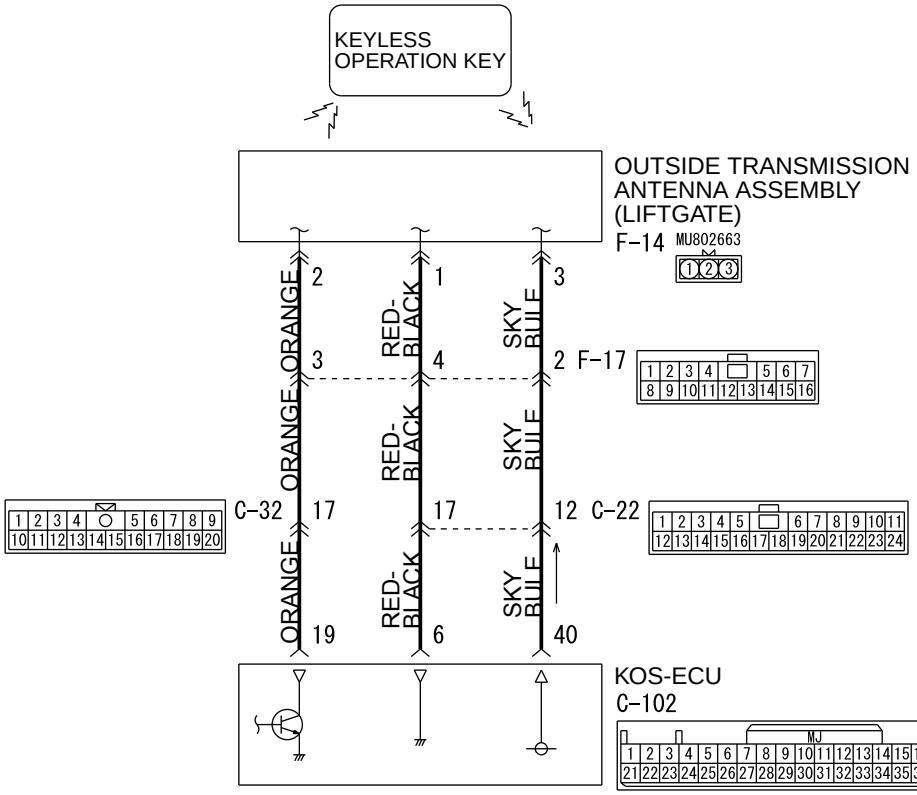
DTC B240C Liftgate antenna(outdoor) open

M14209100026USA0000010000

⚠ CAUTION

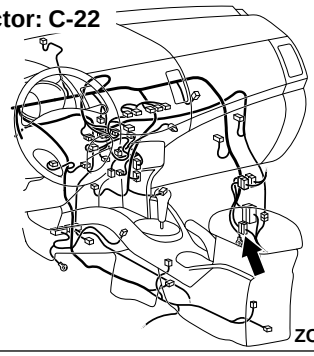
When replacing the ECU, always check that the communication circuit is normal.

Outside Transmission Antenna Assembly (Liftgate) Circuit



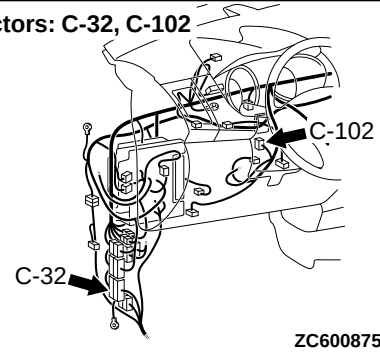
ZC6041380000

Connector: C-22

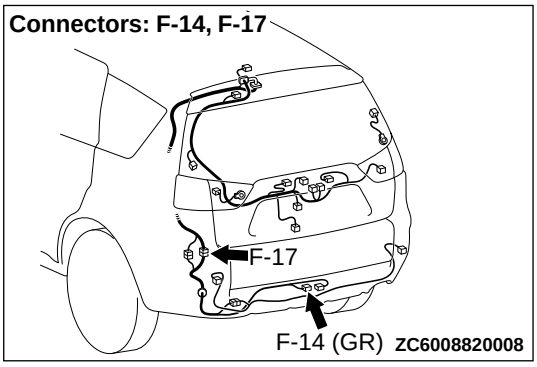


ZC6008760032

Connectors: C-32, C-102



ZC6008750030



DIAGNOSTIC FUNCTION

If an open circuit is detected in the exterior transmitter antenna (liftgate), the diagnostic trouble code is set.

JUDGEMENT CRITERIA

When the ignition push switch is pressed, or when the antenna open circuit detection request is received from the diagnosis function, the failure is detected.

PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (liftgate)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check KOS-ECU connector C-102 and exterior transmitter antenna assembly (liftgate) connector F-14for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and exterior transmitter antenna assembly (liftgate) connector D-101 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.

STEP 2. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 6, 19 and 40) and exterior transmitter antenna assembly (liftgate) connector F-14 (terminal Nos. 1, 2 and 3).

NOTE: Also check intermediate connectors C-22, C-32 and F-17 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22, C-32 and F-17 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 KOS-ECU connector C-102 (terminal Nos. 6, 19 and 40) and exterior transmitter antenna assembly (liftgate) connector F-14(terminal Nos. 1, 2 and 3) in good condition?

YES: Go to Step 3.

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

STEP 3. Keyless operation system communication test

Check that the communication with the exterior transmitter antenna assembly (liftgate) is normal (Refer to Antenna Test P. 42B-169).

Antennas to be checked
liftgate side antenna (exterior)
OK: Normal is displayed.

Q:Is the check result normal?
YES: Go to Step 4.
NO: Replace the exterior transmitter antenna assembly (liftgate).

STEP 4. Check whether the diagnostic trouble code is reset.
(1) Erase the diagnostic trouble code.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the diagnostic trouble code is set.

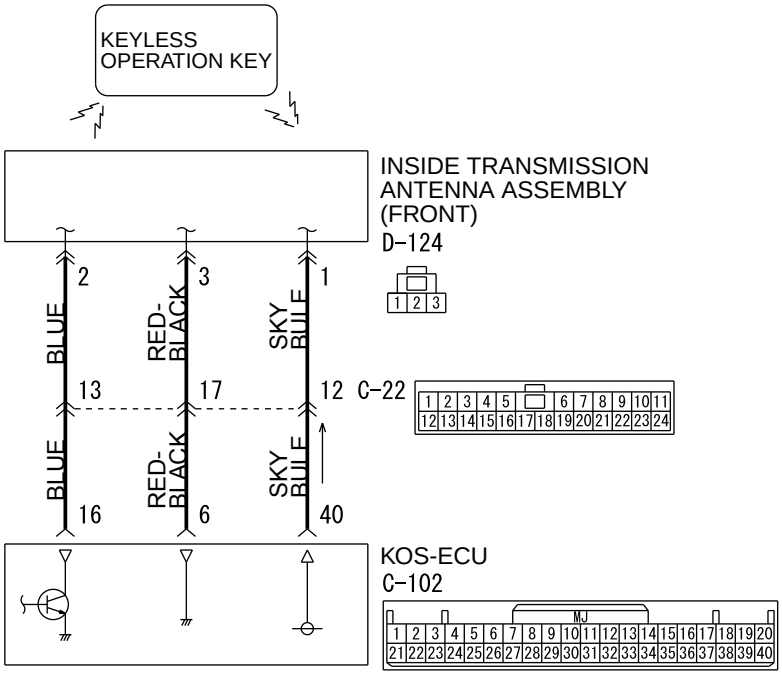
Q:Is the diagnostic trouble code set?
YES: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).
NO: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with Intermittent Malfunction P.00-15).

DTC B240D Front antenna(indoor) open

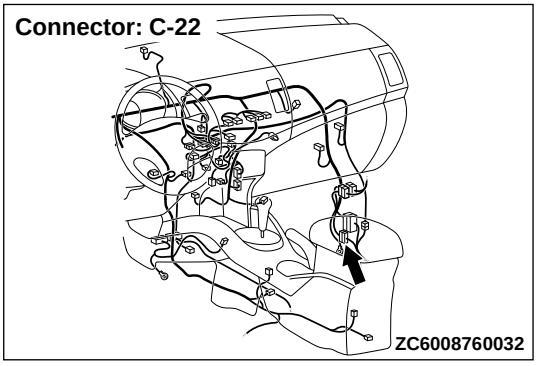
M14209100027USA0000010000

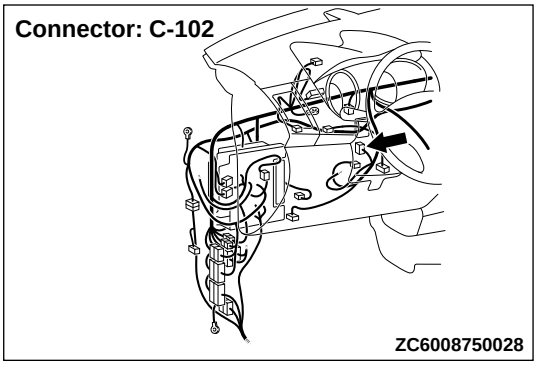
⚠ CAUTION
When replacing the ECU, always check that the communication circuit is normal.

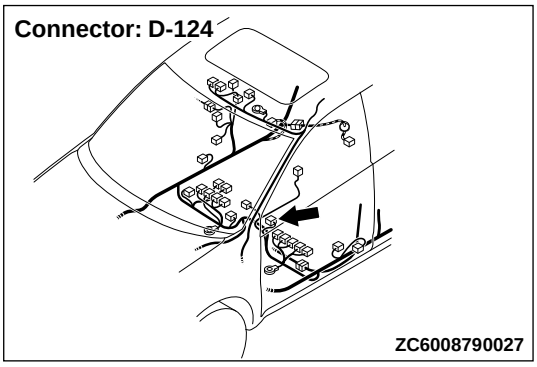
Inside Transmission Antenna Assembly (Front) Circuit



ZC6041600000







DIAGNOSTIC FUNCTION
If an open circuit is detected in the interior transmitter antenna (front), the diagnostic trouble code is set.

JUDGEMENT CRITERIA
When the ignition push switch is pressed, or when the antenna open circuit detection request is received from the diagnosis function, the failure is detected.

PROBABLE CAUSES
- Malfunction of the interior transmitter antenna assembly (front)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check KOS-ECU connector C-102 and interior transmitter antenna assembly (front) connector D-124 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and interior transmitter antenna assembly (front) connector D-124 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.

STEP 2. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 6, 16 and 40) and interior

transmitter antenna assembly (front) connector D-124 (terminal Nos. 3, 2 and 1).

NOTE: Also check intermediate connector C-22 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22 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 KOS-ECU connector C-102 (terminal Nos. 6, 18 and 40) and interior transmitter antenna assembly (front) connector D-124 (terminal Nos. 3, 2 and 1) in good condition?

YES: Go to Step 3.

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

STEP 3. Keyless operation system communication test

Check that the communication with the interior transmitter antenna assembly (front) is normal (Refer to Antenna Test P. 42B-169).

Antennas to be checked

Driver's side antenna (interior)

OK: Normal is displayed.

Q:Is the check result normal?

YES: Go to Step 4.

NO: Replace the interior transmitter antenna assembly (front).

STEP 4. Check whether the diagnostic trouble code is reset.

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

Q:Is the diagnostic trouble code set?

YES: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

NO: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with Intermittent Malfunction P. 00-15).

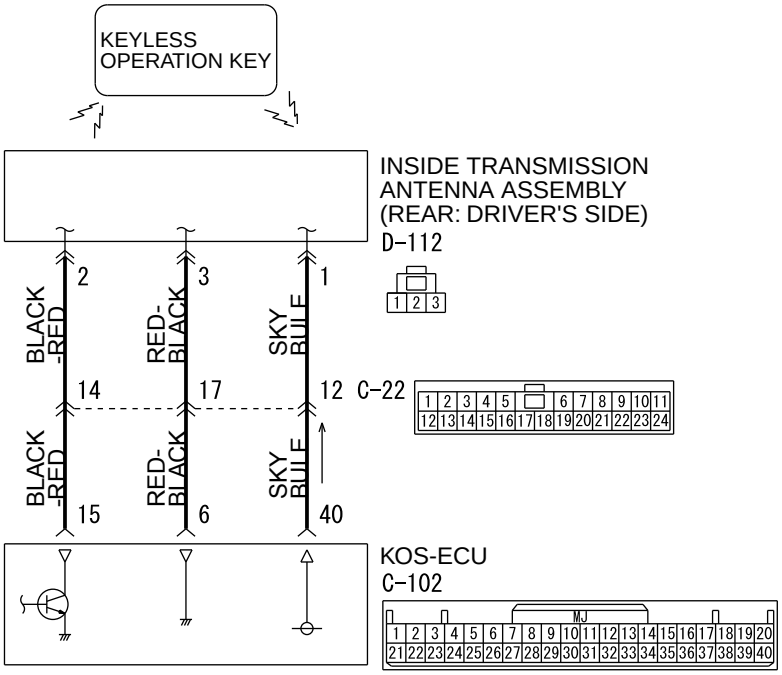
DTC B240E RR antenna(indoor) open

M14209100099USA0000010000

⚠ CAUTION

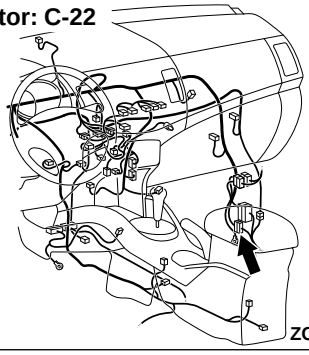
When replacing the ECU, always check that the communication circuit is normal.

Inside Transmission Antenna Assembly (Rear: Driver's Side) Circuit



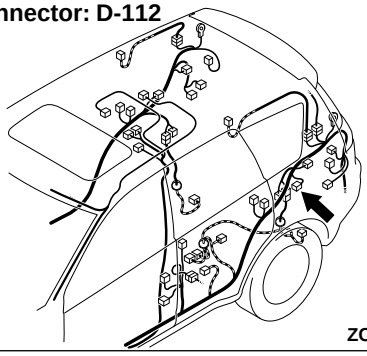
ZC6041610000

Connector: C-22



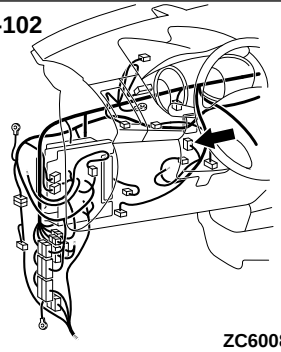
ZC6008760032

Connector: D-112



ZC6008800028

Connector: C-102



ZC6008750028

DIAGNOSTIC FUNCTION

If an open circuit is detected in the interior transmitter antenna (rear: driver's side), the diagnostic trouble code is set.

JUDGEMENT CRITERIA

When the ignition push switch is pressed, or when the antenna open circuit detection request is received from the diagnosis function, the failure is detected.

PROBABLE CAUSES

- Malfunction of interior transmitter antenna assembly (rear: driver's side)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check KOS-ECU connector C-102 and interior transmitter antenna assembly (rear: driver's side) connector D-112 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and interior transmitter antenna assembly (rear: driver's side) connector D-112 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.

STEP 2. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 6, 15 and 40) and interior transmitter antenna assembly (rear: driver's side) connector D-112 (terminal Nos. 3, 2 and 1).

NOTE: Also check intermediate connector C-22 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22 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 KOS-ECU connector C-102 (terminal Nos. 6, 15 and 40) and interior transmitter antenna assembly (rear: driver's side) connector D-112 (terminal Nos. 3, 2 and 1) in good condition?

YES: Go to Step 3.

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

STEP 3. Keyless operation system communication test

Check that the communication with the interior transmitter antenna assembly (rear: driver's side) is normal (Refer to Antenna Test P.42B-169).

Antennas to be checked

Rear driver's side antenna (interior)

OK: Normal is displayed.

Q:Is the check result normal?

YES: Go to Step 4.

NO: Replace the interior transmitter antenna assembly (rear: driver's side).

STEP 4. Check whether the diagnostic trouble code is reset.

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

Q:Is the diagnostic trouble code set?

YES: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).
NO: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with Intermittent Malfunction P.00-15).

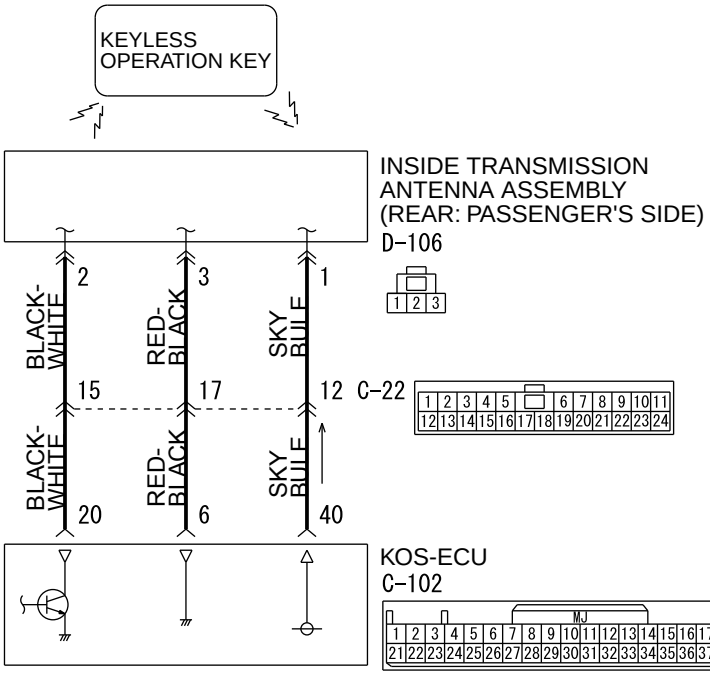
DTC B240F RL antenna(indoor) open

M14209100100USA0000010000

⚠ CAUTION

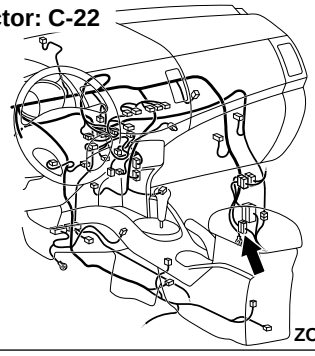
When replacing the ECU, always check that the communication circuit is normal.

Inside Transmission Antenna Assembly (Rear: Passenger's Side) Circuit



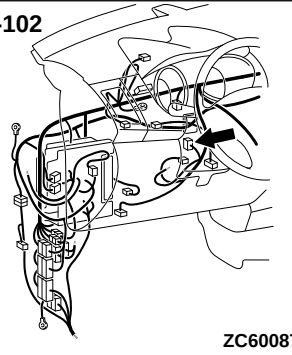
ZC6041620000

Connector: C-22

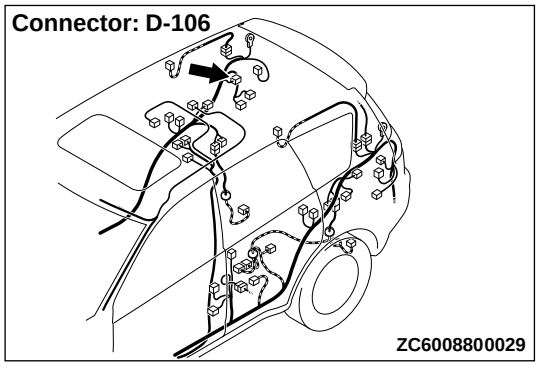


ZC6008760032

Connector: C-102



ZC6008750028



DIAGNOSTIC FUNCTION

If an open circuit is detected in the interior transmitter antenna (rear: passenger's side), the diagnostic trouble code is set.

JUDGEMENT CRITERIA

When the ignition push switch is pressed, or when the antenna open circuit detection request is received from the diagnosis function, the failure is detected.

PROBABLE CAUSES

- Malfunction of interior transmitter antenna assembly (rear: passenger's side)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check KOS-ECU connector C-102 and interior transmitter antenna assembly (rear: passenger's side) connector D-106 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and interior transmitter antenna assembly (rear: passenger's side) connector D-106 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.

STEP 2. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 6, 15 and 40) and interior transmitter antenna assembly (rear: passenger's side) connector D-106 (terminal Nos. 3, 2 and 1).

NOTE: Also check intermediate connector C-22 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22 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 KOS-ECU connector C-102 (terminal Nos. 6, 15 and 40) and interior transmitter antenna assembly (rear: passenger's side) connector D-106 (terminal Nos. 3, 2 and 1) in good condition?

YES: Go to Step 3.

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

STEP 3. Keyless operation system communication test

Check that the communication with the interior transmitter antenna assembly (rear: passenger's side) is normal (Refer to Antenna Test P.42B-169).

Antennas to be checked
Rear front passenger's side antenna (interior)
OK: Normal is displayed.

Q:Is the check result normal?
YES: Go to Step 4.
NO: Replace the interior transmitter antenna assembly (rear: passenger's side).

STEP 4. Check whether the diagnostic trouble code is reset.
(1) Erase the diagnostic trouble code.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the diagnostic trouble code is set.

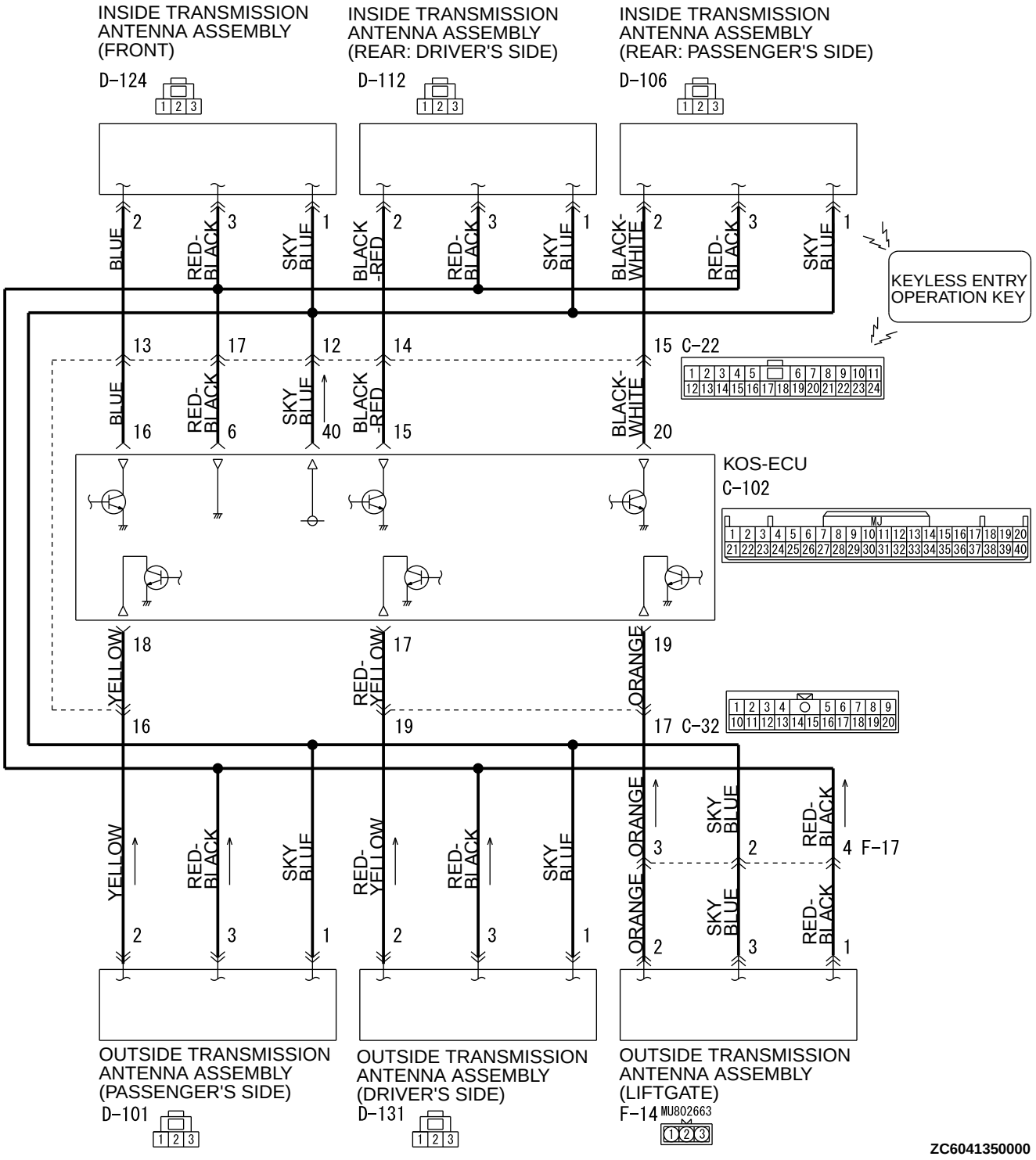
Q:Is the diagnostic trouble code set?
YES: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).
NO: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with Intermittent Malfunction P.00-15).

DTC B2412 LF antenna power voltage

M142091000030USA0000010000

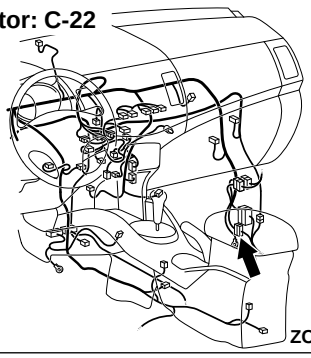
CAUTION
・If diagnostic trouble code No. B2412 is set, diagnose the CAN bus lines.
・When replacing the ECU, always check that the communication circuit is normal.

Antenna Assembly Circuit



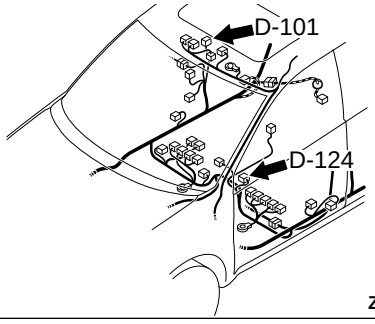
ZC6041350000

Connector: C-22



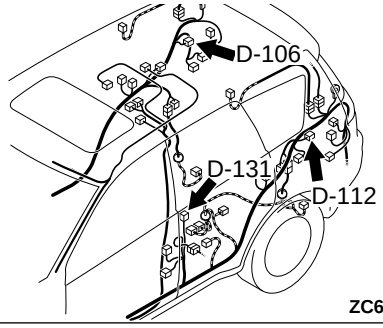
ZC6008760032

Connectors: D-101, D-124



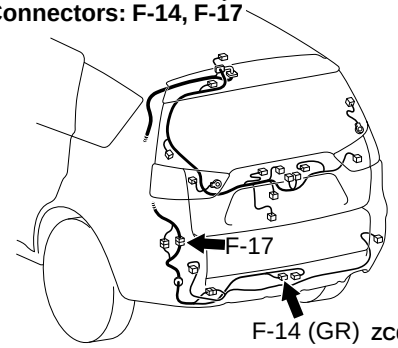
ZC6008790025

Connectors: D-106, D-112, D-131



ZC6008800026

Connectors: F-14, F-17



ZC6008820008

DIAGNOSTIC FUNCTION

If KOS-ECU detects an abnormality in power supply of the exterior or interior antennas, KOS-ECU sets diagnostic trouble code No. B2412.

JUDGEMENT CRITERIA

If an abnormality in power supply of the exterior or interior transmitter antenna is detected when power supply of it is turned on, KOS-ECU determines that there is a problem.

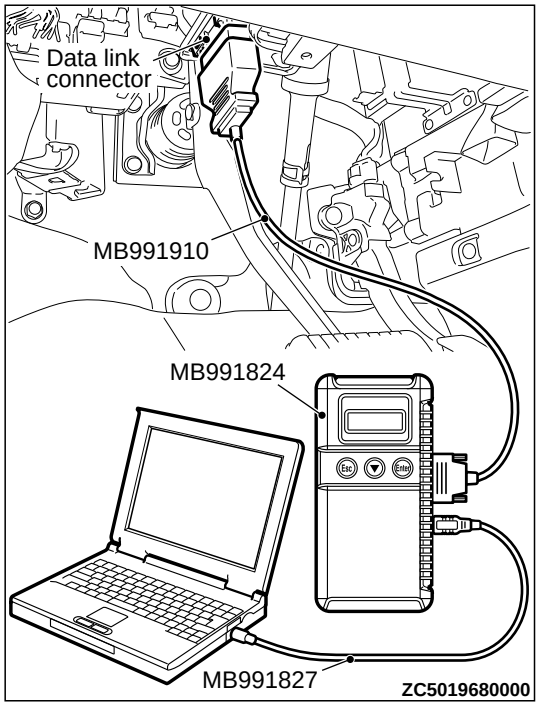
PROBABLE CAUSES

- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the CAN bus lines related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Repair the CAN bus line (Refer to GROUP 54D, CAN bus diagnostics table P.54D-17).
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is KOS-ECU connector C-102 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.

STEP 3. Check the wiring harness between KOS-ECU and each interior and exterior antenna.

Check the following wiring harnesses for open circuit and short to ground.

- Wiring harness between KOS-ECU connector C-102 (terminal No. 40) and exterior transmitter antenna assembly (driver's side) connector D-131 (terminal No. 1)
- Wiring harness between KOS-ECU connector C-102 (terminal No. 40) and exterior transmitter antenna assembly (front passenger's side) connector D-101 (terminal No. 1)
- Wiring harness between KOS-ECU connector C-102 (terminal No. 40) and interior transmitter antenna (front) connector D-124 (terminal No. 1)
- Wiring harness between KOS-ECU connector C-102 (terminal No. 40) and interior transmitter antenna (rear: driver's side) connector D-112 (terminal No. 1)
- Wiring harness between KOS-ECU connector C-102 (terminal No. 40) and interior transmitter antenna (rear: front passenger's side) connector D-106 (terminal No. 1)

- Wiring harness between KOS-ECU connector C-102 (terminal No. 40) and exterior transmitter antenna assembly (liftgate) connector F-14 (terminal No. 3)

NOTE: Also check intermediate connectors C-22 and F-17 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connectors C-22 and F-17 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P. 00E-2.

Q:Are the wiring harness between KOS-ECU connector C-102 and each interior and exterior antenna in good condition?

YES: Go to Step 4.

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.

STEP 4. Check whether the diagnostic trouble code is reset.

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

Q:Is the diagnostic trouble code set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-163.)

NO: The procedure is complete.

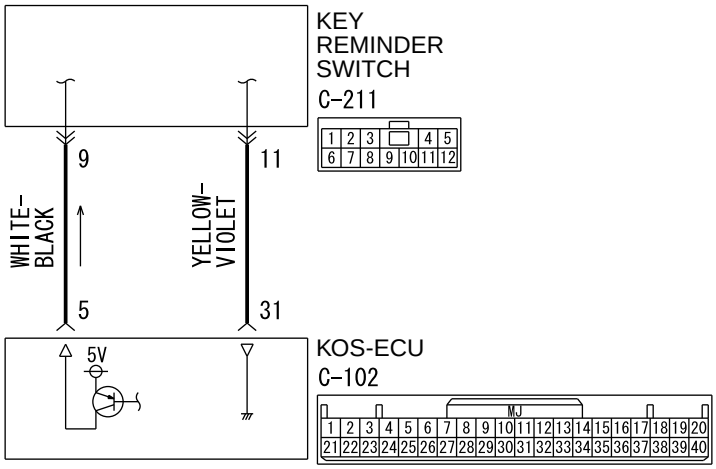
DTC B2413: STL unit power voltage

M14209100127USA0000010000

⚠ CAUTION

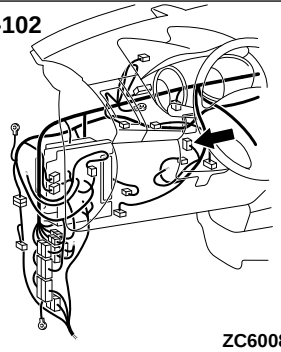
- **If the DTC B2413 is set in the steering lock unit, diagnose the CAN bus lines. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set DTC is not highly reliable.**
- **Whenever the steering lock unit (integrated in the key reminder switch) is replaced, ensure that the communication circuit is normal.**

Key Reminder Switch and KOS-ECU Circuit



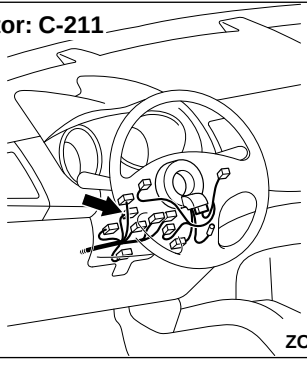
D7G42M002A00

Connector: C-102



ZC6008750028

Connector: C-211



ZC6008770002

DTC SET CONDITION

If KOS-ECU detects an abnormality in power supply of the steering lock unit, KOS-ECU sets the DTC B2413.

TECHNICAL DESCRIPTION (COMMENT)

If an abnormality in power supply of the exterior or interior transmitter antenna is detected when power supply of it is turned on, KOS-ECU determines that there is a problem.

TROUBLESHOOTING HINTS

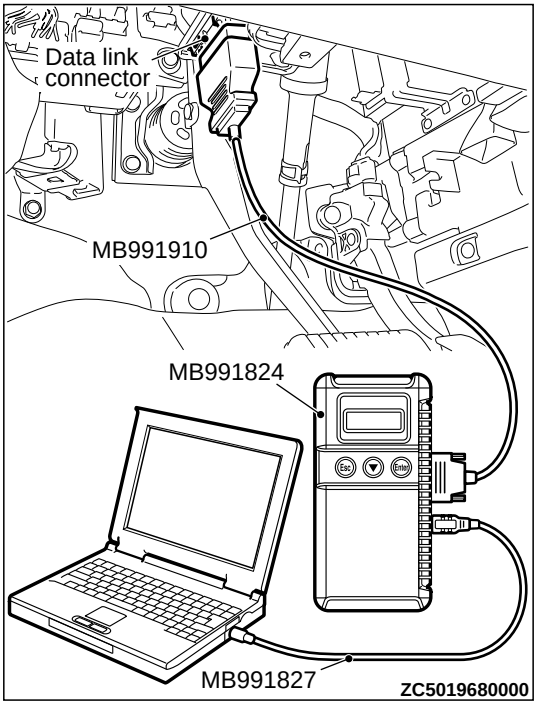
- Damaged wiring harness and connectors
- Malfunction of the steering lock unit (integrated into the key reminder switch)
- Malfunction of the KOS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

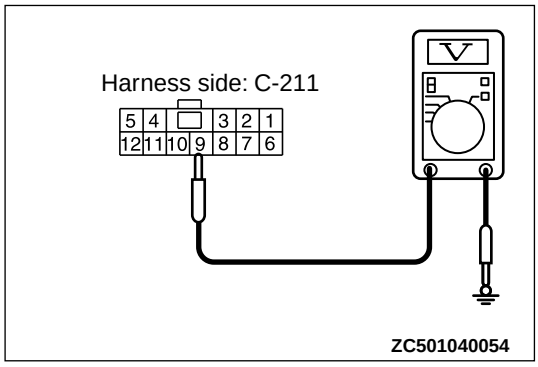
STEP 2. Check key reminder switch connector C-211 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is tye key reminder switch connector C-211 in good condition?

YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the power supply circuit to the key reminder switch. Measure the voltage at key reminder switch connector C-211.

(1) Disconnect the connector, and measure at the harness side.
(2) Turn the ignition push switch to the ON position.



(3) Measure the voltage between terminal No. 9 and ground.
- The voltage should measure 5 ± 0.5 volts.

Q:Is the measured voltage 5 ± 0.5 volts?
YES: Go to Step 4.
NO:
Check the KOS-ECU connector C-102 and the wiring harness between the KOS-ECU connector C-102 (terminal No. 5) and the key reminder switch connector C-211 (terminal No. 9), and repair them if necessary. If it is normal, replace KOS-ECU and register the ID codes. (Refer to P. 42B-12.)

NOTE: Check the power supply line for open circuit and short circuit.

STEP 4. Check KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the KOS-ECU connector C-102 in good condition?
YES: Go to Step 5.
NO: Repair the defective connector.

STEP 5. Check the wiring harness between the key reminder switch connector C-211 (terminal No. 11) and the KOS-ECU connector C-102 (terminal No. 31).
Check the ground wires for open circuit.

Q:Is the wiring harness between key reminder switch connector C-211 (terminal No. 11) and the KOS-ECU connector C-102 (terminal No. 31) in good condition?
YES: Go to Step 6.
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 6. Replace the key reminder switch, and check whether the diagnostic trouble code is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
(3) Check if the DTC is set.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P. 42B-12.)
NO: The procedure is complete.

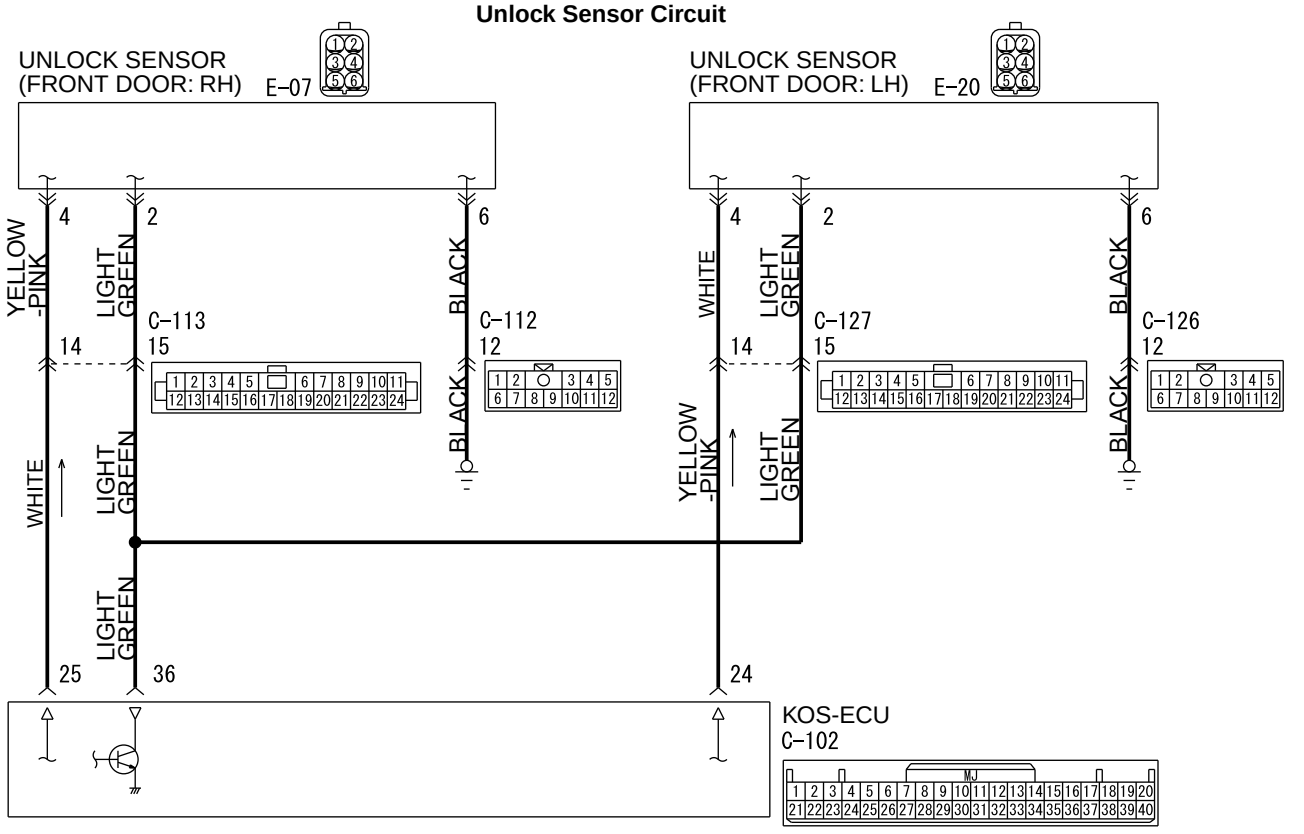
DTC B2414 Unlock sensor fail

M14209100115USA0000010000

⚠ CAUTION

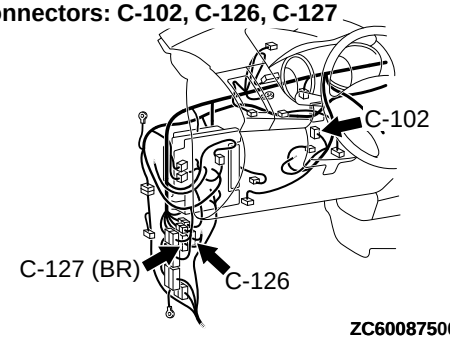
- **If the DTC B2414 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

Unlock Sensor Circuit



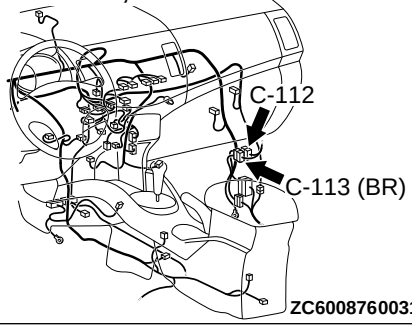
ZC6041340000

Connectors: C-102, C-126, C-127

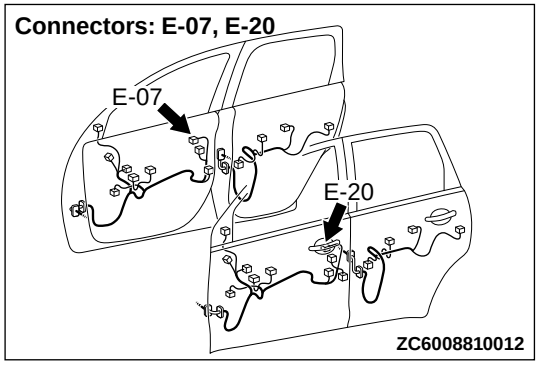


ZC6008750026

Connectors: C-112, C-113



ZC6008760031



TECHNICAL DESCRIPTION (COMMENT)

If an abnormality in power supply of the unlock sensor is detected when power supply of it is turned on, KOS-ECU determines that there is a problem.

TROUBLESHOOTING HINTS

- Damaged wiring harness and connectors
- Malfunctions of the unlock sensor
- Malfunction of the KOS-ECU

DTC SET CONDITION

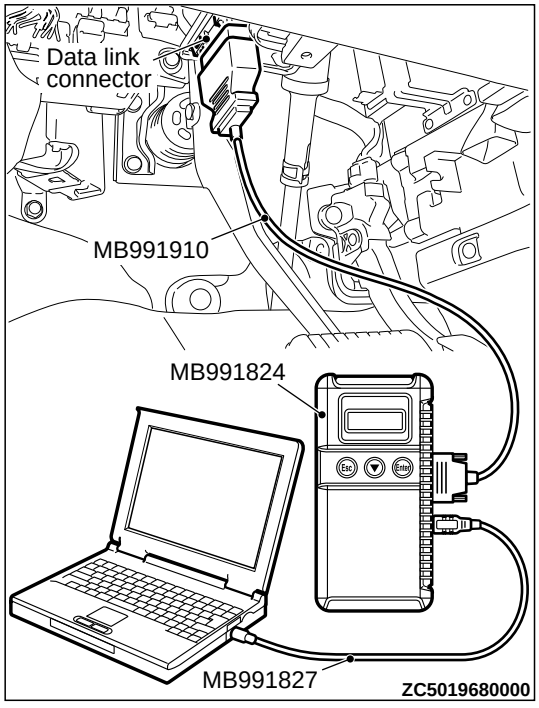
If KOS-ECU detects an abnormality in power supply of the unlock sensor, KOS-ECU sets the diagnostic trouble code No. B2414.

DIAGNOSIS

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

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



⚠ CAUTION

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

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

Q:Is the DTC set?

YES: Repair the CAN bus line (Refer to GROUP 54D, CAN bus diagnostics table P.54D-17).
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102, unlock sensor (front door: LH) connector E-20 and unlock sensor (front

door: RH) connector E-07 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102, unlock sensor (front door: LH) connector E-20 and unlock sensor (front door: RH) connector E-07 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.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 24 and 36) and unlock sensor (front door: LH) connector E-20 (terminal Nos. 4 and 2).
NOTE: Also check intermediate connector C-127 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-127 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 KOS-ECU connector C-102 (terminal Nos. 24 and 36) and unlock sensor (front door: LH) connector E-20 (terminal Nos. 4 and 2) in good condition?
YES: Go to Step 4.
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.

STEP 4. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 25 and 36) and unlock sensor (front door: RH) connector E-07 (terminal Nos. 4 and 2).
NOTE: Also check intermediate connector C-113 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-113is 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 KOS-ECU connector C-102 (terminal Nos. 25 and 36) and unlock sensor (front door: RH) connector E-07 (terminal Nos. 4 and 2) in good condition?
YES: Go to Step 5.
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.

STEP 5. Replace the unlock sensor, and check whether the diagnostic trouble code is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-163.)

NO: Intermittent malfunction is suspected. (Refer to GROUP 00, How to cope with intermittent malfunctions P.00-15.)

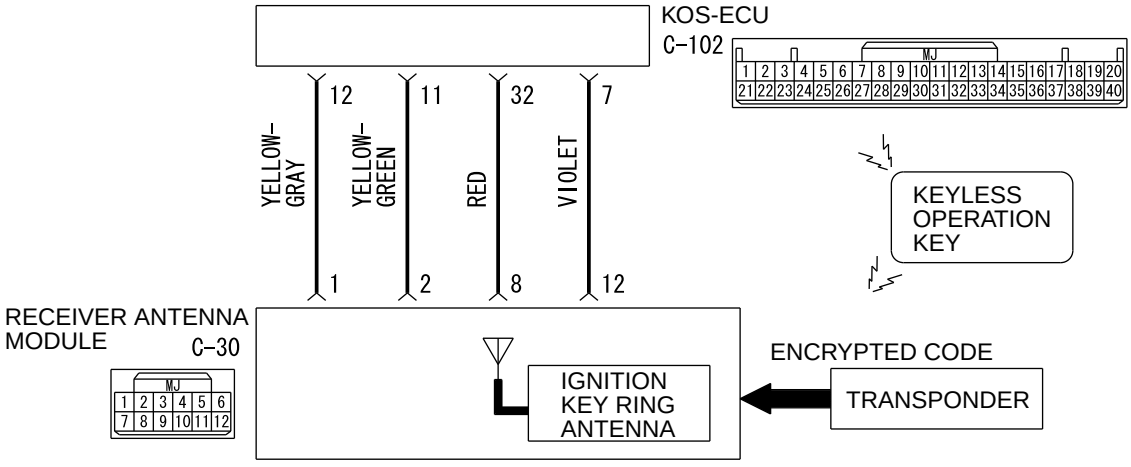
DTC B2415: RA module power voltage

M14209100032USA0000010000

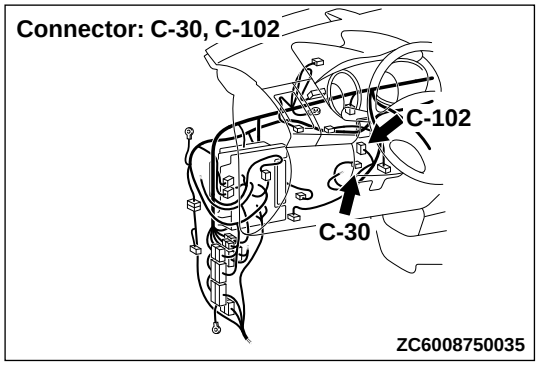
⚠ CAUTION

- **If the DTC B2352 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

Receiver Antenna Module and KOS-ECU Circuit



D7G42M001A00



DTC SET CONDITION

If an open circuit or short to ground occurs in the immobilizer antenna, KOS-ECU sets the DTC B2352.

TECHNICAL DESCRIPTION (COMMENT)

When the ignition switch is turned ON, KOS-ECU sends signals to the receiver antenna module. The receiver antenna transmits random numbers to the emergency key when it receives signals from KOS-ECU. If an open circuit or short to ground occurs on the wiring harness between KOS-ECU and receiver antenna at this time, KOS-ECU determines that there is a problem.

TROUBLESHOOTING HINTS

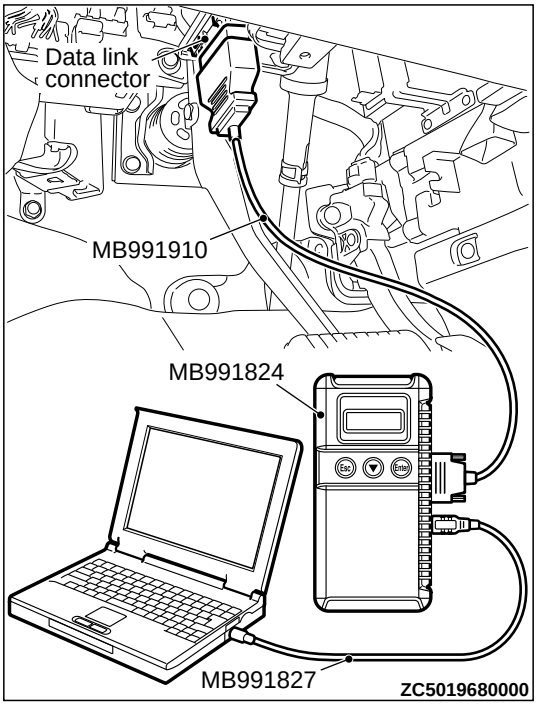
- Malfunction of the receiver antenna module
- Damaged wiring harness and connectors
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 to the data link connector.
(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 54D, Diagnosis P.54D-17).

STEP 2. Check receiver antenna module connector C-30 and KOS-ECU connector C-102 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the eceiver antenna module connector C-30 and KOS-ECU connector C-102 in good condition?

YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the wiring harness between the receiver antenna module connector C-30 (terminal No. 8, 12) and the KOS-ECU connector C-108 (terminal No. 32, 7).

- Check the power supply and ground wires for open circuit.

Q:Is the wiring harness between receiver antenna module connector C-30 (terminal No. 8, 12) and the KOS-ECU connector C-108 (terminal No. 32, 7) in good condition?

YES: Go to Step 4.

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.

STEP 4. Replace the receiver antenna module, and check whether the diagnostic trouble code is reset.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC B2416: ECU internal error

M14209100033USA0000010000

DTC SET CONDITION

KOS-ECU sets DTC B2416 when it determines itself to be in abnormal status.

TECHNICAL DESCRIPTION (COMMENT)

KOS-ECU determines that the abnormality is present, if the data abnormality is found when the ignition switch is turned ON and then EEPROM is written.

TROUBLESHOOTING HINTS

Malfunction of KOS-ECU

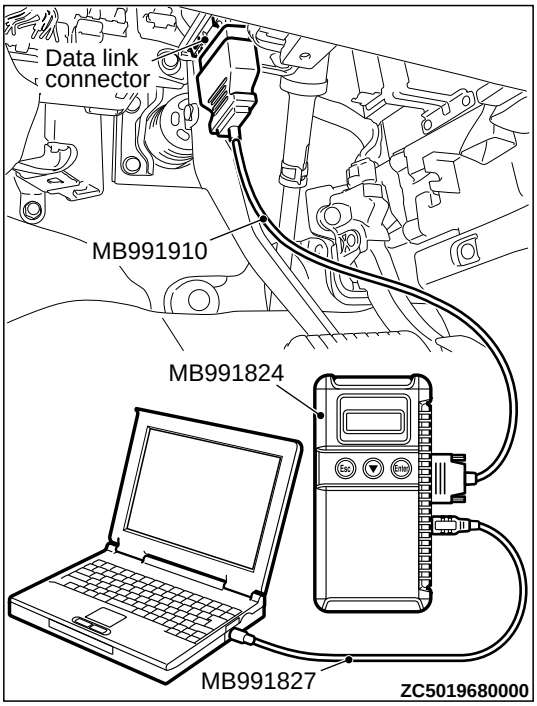
DIAGNOSIS

Required Special Tools:

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

Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-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).

(1) Connect scan tool MB991958 to the data link connector.
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(4) Check if DTC is set.
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC C1608: EEPROM Error

M14209100152USA0000010000

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION

KOS-ECU incorporates EEPROM (nonvolatile memory), and that EEPROM stores the TPMS information. When the data in EEPROM is failed, this code is set.

TROUBLESHOOTING HINTS

The most likely causes for this DTC to set are:
- Damaged wiring harness and connector
- Malfunction of KOS-ECU

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?
YES: Go to Step 3.
NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines
(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the diagnostic trouble code C1608 set?
YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then go to Step 3.
NO: The procedure is complete.

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

Q:Is the diagnostic trouble code C1608 reset?
YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then start over at Step 1.
NO: The procedure is complete.

DTC C1900: No Registration

M14209100151USA0000010000

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION
When the ID registration information of the TPMS transmitter is not stored in KOS-ECU, this code is set. If the ID registration mode is terminated forcibly after one or more wheels are registered in the ID registration mode, the ID information in the KOS-ECU is erased, and this diagnostic trouble code is set.

TROUBLESHOOTING HINTS
The most likely causes for this DTC to set are:

- Damaged wiring harness and connector
- Malfunction of TPMS transmitter
- Malfunction of KOS-ECU

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics
Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?
YES: Go to Step 3.
NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines
(1) Turn the ignition switch to the "ON" position.
(2) TPMS transmitter ID registration. (Refer to P.42B-172.)
(3) Turn the ignition switch to the "LOCK" (OFF) position.
(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the diagnostic trouble code C1900 set?
YES: Go to Step 3.
NO: The procedure is complete.

STEP 3. TPMS transmitter ID registration.
Refer to P.42B-172.

Q:Is the TPMS transmitter ID registration completed normally?
YES: Go to Step 5.
NO: Replace the TPMS transmitter whose ID code cannot be registered. Then go to Step 4.

STEP 4. TPMS transmitter ID registration.
Refer to P.42B-172.

Q:Is the TPMS transmitter ID registration completed normally?
YES: Go to Step 5.
NO: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then go to Step 5.

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set.
(1) Turn the ignition switch to the "ON" position.
(2) TPMS transmitter ID registration. (Refer to P.42B-172.)
(3) Turn the ignition switch to the "LOCK" (OFF) position.

(4) Turn the ignition switch to the "ON" position.
(5) Check if the DTC is set.
(6) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the diagnostic trouble code C1900 reset?
YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then start over at Step 1.
NO: The procedure is complete.

DTC C1901: Vehicle Speed Information Abnormality

M14209100153USA0000010000

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION
KOS-ECU receives the wheel speed information from ABS-ECU or ASC-ECU via the CAN-bus line. Although KOS-ECU receives the information that the wheel is not currently rotated from ABS-ECU or ASC-ECU, if the TPMS transmitter sends the information that the wheel is rotated, this code is set.

TROUBLESHOOTING HINTS
The most likely causes for this DTC to set are:
- Damaged wiring harness and connector
- Malfunction of TPMS transmitter
- Malfunction of KOS-ECU
- Malfunction of ABS-ECU or ASC-ECU

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics
Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?
YES: Go to Step 3.
NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines
(1) Start the engine and drive the vehicle at 5 km/h or more.

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

Q:Is the diagnostic trouble code C1901 set?
YES: Go to Step 3.
NO: The procedure is complete.

STEP 3. Check for other diagnostic trouble code.
Check if the diagnostic trouble code is set from ABS-ECU or ASC-ECU.<Refer to GROUP 35B,diagnostic trouble code chart P.35B-9(vehicles without ASC) or Refer to GROUP 35C, diagnostic trouble code chart P.35C-11(vehicles with ASC)>

Q:Is the check result normal?
YES: Check the registered ID by the transmitter ID check function, and then check the acceleration value of each wheel by the transmitter check function. If the value exceeding 5 g is displayed, replace the relevant TPMS transmitter and register the ID code. If the value exceeding 5 g is not displayed for any TPMS transmitter, replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then go to Step 4.
NO: Carry out the troubleshooting for ABS-ECU or ASC-ECU.<Refer to GROUP 35B, diagnostic trouble code chart P.35B-9(vehicles without ASC) or Refer to GROUP 35C, diagnostic trouble code chart P.35C-11(vehicles with ASC)>. Then go to Step 4.

STEP 4. Recheck for diagnostic trouble code.
(1) Start the engine and drive the vehicle at 5 km/h or more.
(2) Turn the ignition switch to the "LOCK" (OFF) position.
(3) Turn the ignition switch to the "ON" position.
(4) Check if the DTC is set.
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the diagnostic trouble code C1901 set?
YES: Start over at Step 1.
NO: The procedure is complete.

DTC C1910: Transmitter Low Battery Voltage Abnormality 1
DTC C1920: Transmitter Low Battery Voltage Abnormality 2
DTC C1930: Transmitter Low Battery Voltage Abnormality 3
DTC C1940: Transmitter Low Battery Voltage Abnormality 4

M14209100154USA0000010000

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION
When the voltage of the battery incorporated into the TPMS transmitter becomes low, this code is set.

TROUBLESHOOTING HINTS
The most likely causes for this DTC to set are:
- Low battery that is incorporated into the TPMS transmitter
- Damaged wiring harness and connector
- Malfunction of TPMS transmitter

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics
Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?
YES: Check the registered ID by the transmitter ID check function, and detect the wheel to which the DTC is set by the transmitter check function. Then, replace the TPMS transmitter, and register the ID codes. (refer to P.42B-12.) Then go to Step 3.
NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines
(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 diagnostic trouble code C1910, C1920, C1930 or C1940 set?
YES: Start over at Step 1.
NO: The procedure is complete.

STEP 3. Recheck for diagnostic trouble code.
(1) Turn the ignition switch to the "LOCK" (OFF) position.
(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 diagnostic trouble code C1910, C1920, C1930 or C1940 set?
YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then start over at Step 1.
NO: The procedure is complete.

DTC C1911: Reception Abnormality 1
DTC C1921: Reception Abnormality 2
DTC C1931: Reception Abnormality 3
DTC C1941: Reception Abnormality 4

M14209100155USA0000010000

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION

When KOS-ECU cannot receive the signal from the TPMS transmitter normally, this code is set.

TROUBLESHOOTING HINTS

The most likely causes for this DTC to set are:
- Damaged wiring harness and connector
- Malfunction of TPMS transmitter
- Malfunction of KOS-ECU

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?

YES: Check the registered ID by the transmitter ID check function, and detect the wheel to which the DTC is set by the transmitter check function. Then, replace the TPMS transmitter, and register the ID codes. (Refer to P.42B-12.) If the ID code of replaced TPMS transmitter cannot be registered, replace the KOS-ECU and register the ID code. Then go to Step 3.

NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

(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 diagnostic trouble code C1911, C1921, C1931 or C1941 set?
YES: Start over at Step 1.
NO: The procedure is complete.

STEP 3. Recheck for diagnostic trouble code.
(1) Turn the ignition switch to the "LOCK" (OFF) position.
(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 diagnostic trouble code C1911, C1921, C1931 or C1941 set?
YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then start over at Step 1.
NO: The procedure is complete.

DTC C1912: Tire Inflation pressure Warning 1
DTC C1922: Tire Inflation pressure Warning 2
DTC C1932: Tire Inflation pressure Warning 3
DTC C1942: Tire Inflation pressure Warning 4

M14209100156USA0000010000

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION
When the tire pressure becomes lower than the specified value, the TPMS transmitter sends the signal to KOS-ECU, and then KOS-ECU sets this code.

TROUBLESHOOTING HINTS
The most likely causes for this DTC to set is:
- Drop of the tire pressure
- Loose TPMS transmitter mounting nut
- Flat tire
- TPMS transmitter malfunction
- KOS-ECU malfunction
- CAN-bus line malfunction

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable

- MB991910: M.U.T.-III Main Harness A

STEP 1. M.U.T.-III CAN bus diagnostics
Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?
YES: Go to Step 3.
NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

Q:Is DTC C1912, C1922, C1932 or C1942 set?
YES: Go to Step 3.
NO: The procedure is complete.

STEP 3. Tire pressure check
Check that the pressure of the tire corresponds to the set DTC is normal.

Q:Is the check result normal?
YES: Go to Step 5.
NO: Go to Step 4.

STEP 4. Tire check
Check that there is no abnormality for the items below.
- Flat tire
- Cracked tire
- Air leak from valve
- Loose TPMS transmitter mounting nut (Refer to P.42C-99.)

Q:Is the check result normal?
YES: Go to Step 5.
NO: Replace it. Then go to Step 7.

STEP 5. Tire pressure check by M.U.T.-III
(1) Check the registered ID code by the transmitter ID check function.
(2) Check the wheel to which the DTC is set by the transmitter check function.
(3) Using the M.U.T.-III, check the relevant tire pressure.
(4) Using the tire pressure gauge, check the tire pressure at the air valve of relevant tire. Then, measure the difference between that checked tire pressure and the tire pressure displayed at the procedure (3).
OK: 20 kPa or less

Q:Is the check result normal?
YES: Go to Step 6.
NO: Replace the TPMS transmitter and register the ID codes. (refer to P.42C-8.) Then go to Step 7.

STEP 6. Tire pressure check by M.U.T.-III
(1) Check the registered ID code by the transmitter ID check function.
(2) Check the wheel to which the DTC is set by the transmitter check function.

(3) Using the M.U.T.-III, check the relevant tire pressure.
(4) Using the tire pressure gauge, check the tire pressure at the air valve of relevant tire. Then, measure the difference between that checked tire pressure and the tire pressure displayed at the procedure (3).
OK: 20 kPa or less

Q:Is the check result normal?
YES: Go to Step 7.
NO: Replace the KOS-ECU and register the ID codes. (refer to P.42C-8.) Then go to Step 7.

STEP 7. Recheck for diagnostic trouble code.
(1) Correct the tire pressure for all wheels.
(2) Turn the ignition switch to the "LOCK" (OFF) position.
(3) Turn the ignition switch to the "ON" position.
(4) Check if the DTC is set.
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the diagnostic trouble code C1912, C1922, C1932 or C1942 set?
YES: Start over at Step 1.
NO: The procedure is complete.

DTC C1913: Acceleration Sensor Abnormality 1
DTC C1923: Acceleration Sensor Abnormality 2
DTC C1933: Acceleration Sensor Abnormality 3
DTC C1943: Acceleration Sensor Abnormality 4

M14209100157USA0000010000

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION
The TPMS transmitter detects if the wheel is rotated and sends the signals to KOS-ECU. When the TPMS transmitter judges that the portion for detecting the wheel rotation is failed, the failure signal is send to KOS-ECU, and KOS-ECU sets this code.

TROUBLESHOOTING HINTS
The most likely causes for this DTC to set are:
- Damaged wiring harness and connector
- Malfunction of TPMS transmitter
- Malfunction of KOS-ECU

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?

YES: Check the registered ID by the transmitter ID check function, and detect the wheel to which the DTC is set by the transmitter check function. Then, replace the TPMS transmitter, and register the ID codes. (refer to P. 42B-12.) Then go to Step 3.

NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

(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 diagnostic trouble code C1913, C1923, C1933 or C1943 set?

YES: Start over at Step 1.

NO: The procedure is complete.

STEP 3. Recheck for diagnostic trouble code.

(1) Turn the ignition switch to the "LOCK" (OFF) position.
(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 diagnostic trouble code C1913, C1923, C1933 or C1943 set?

YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then start over at Step 1.

NO: The procedure is complete.

DTC C1914: Pressure Sensor Abnormality 1
DTC C1924: Pressure Sensor Abnormality 2
DTC C1934: Pressure Sensor Abnormality 3
DTC C1944: Pressure Sensor Abnormality 4

M14209100158USA0000010000

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION

The TPMS transmitter detects if the tire pressure is normal and sends the signal to KOS-ECU. When the TPMS transmitter judges that the portion for detecting the tire pressure is failed, the failure signal is send to KOS-ECU, and KOS-ECU sets this code.

TROUBLESHOOTING HINTS

The most likely causes for this DTC to set are:

- Damaged wiring harness and connector
- Malfunction of TPMS transmitter
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. M.U.T.-III CAN bus diagnostics

Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?

YES: Check the registered ID by the transmitter ID check function, and detect the wheel to which the DTC is set by the transmitter check function. Then, replace the TPMS transmitter, and register the ID codes. (refer to P. 42B-12.) Then go to Step 3.

NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines

(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 diagnostic trouble code C1914, C1924, C1934 or C1944 set?

YES: Start over at Step 1.

NO: The procedure is complete.

STEP 3. Recheck for diagnostic trouble code.

(1) Turn the ignition switch to the "LOCK" (OFF) position.
(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 diagnostic trouble code C1914, C1924, C1934 or C1944 set?
YES: Replace the KOS-ECU and register the ID codes. (refer to P.42B-12.) Then start over at Step 1.
NO: The procedure is complete.

DTC U0019: Bus off(CAN-B)

M14209100101USA0000010000

⚠ CAUTION
- **If DTC U0019 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
If the CAN-B circuit malfunction occurs, the combination meter sets the DTC U0019.

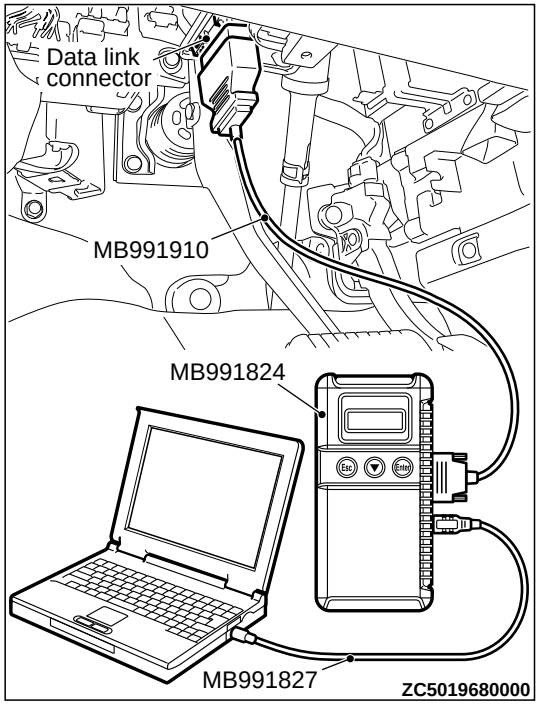
JUDGMENT CRITERIA
If KOS-ECU cannot perform the data transmission in normal conditions due to a malfunction of the CAN-B bus circuit, KOS-ECU determines that there is a problem.

TROUBLESHOOTING HINTS
The CAN bus line may be defective

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1.Recheck for diagnostic trouble code.
Check again if the DTC is set to the KOS-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.

(1) Connect scan tool MB991958. Refer to "How to connect the Scan Tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Go to Step 2.
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

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

(1) Turn the ignition switch to the "ON" position.
(2) Diagnose the CAN bus line.
(3) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
NO: Repair the CAN bus line. (Refer to GROUP 54D, Diagnosis P.54D-17).

DTC U0141: ETACS-ECU CAN timeout

M14209100102USA0000010000

⚠ CAUTION

- **If the DTC U0141 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If the signal from ETACS-ECU cannot be received, the KOS-ECU sets the DTC U0141.

TROUBLESHOOTING HINTS

- Malfunction of CAN bus line
- Malfunction of KOS-ECU
- Malfunction of ETACS-ECU

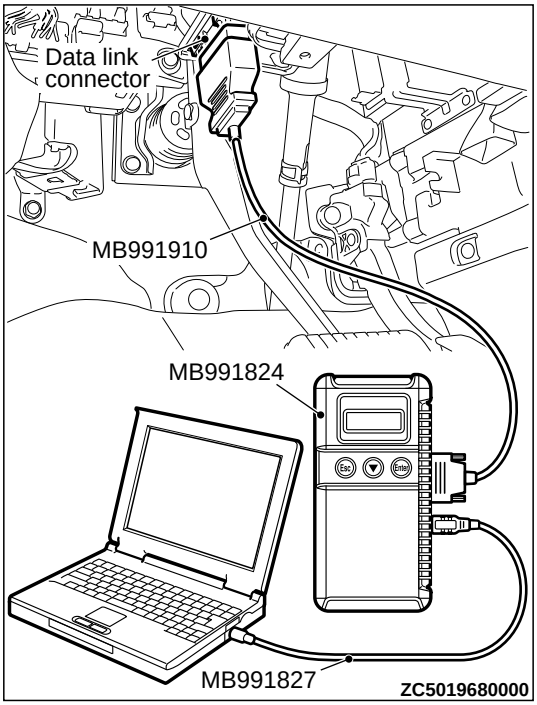
DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)

- MB991824: Vehicles Communication Interface (V.C.I.)
- MB991827: M.U.T.-III USB Cable
- MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code

Check again if the DTC is set to the ETACS-ECU.

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU (Refer to GROUP 54Ad - P. 54Ad-8).
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U0151: SRS-ECU CAN timeout

M14209100103USA0000010000

⚠ CAUTION

- **If the DTC U0151 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If no signal from SRS-ECU can be received, KOS-ECU sets the diagnostic trouble code No. U0151.

TROUBLESHOOTING HINTS

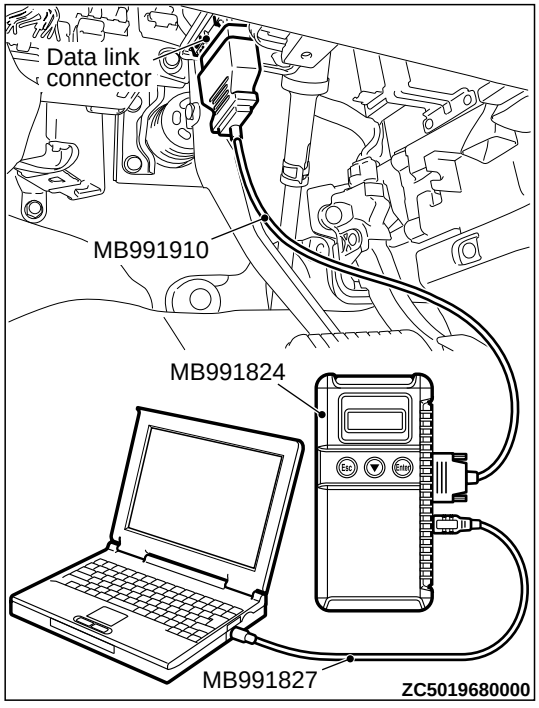
- The CAN bus line may be defective
- The SRS-ECU may be defective
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the SRS-ECU diagnostic trouble code

Check again if the DTC is set to the SRS-ECU.

Q:Is the DTC set?

YES: Troubleshoot the SRS (Refer to GROUP 52B, Troubleshooting P.52B-33).

NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U0154: Occupant classification-ECU CAN timeout

M14209100165USA0000010000

⚠ CAUTION

- **If the DTC U0154 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signals from occupant classification-ECU cannot be received, the KOS-ECU sets the DTC U0154.

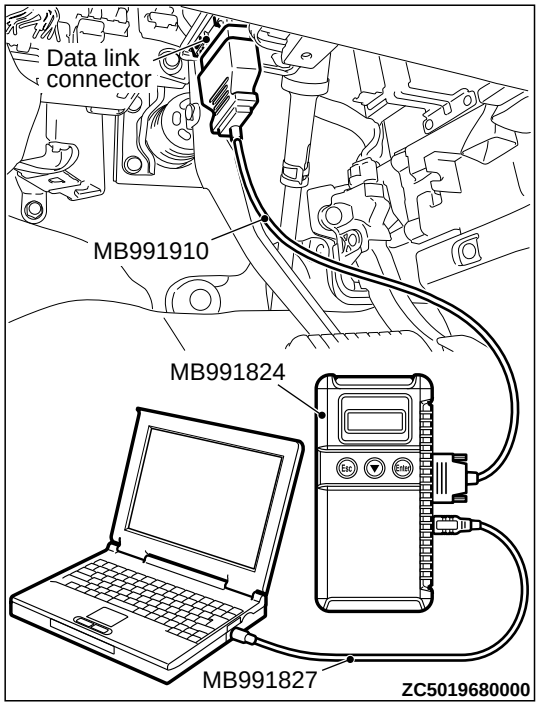
TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The KOS-ECU may be defective.
- The occupant classification-ECU may be defective.

DIAGNOSIS

Required Special Tools:

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



STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the SRS-ECU diagnostic trouble code.

Check if DTC is set to the SRS-ECU.

Q:Is the DTC set?

YES: Troubleshoot the SRS. (Refer to GROUP 52B, Diagnosis P.52B-33.)
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U0155: Combination meter CAN timeout

M14209100104USA0000010000

⚠ CAUTION

- **If the diagnostic trouble code No. U0155 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

TROUBLE JUDGMENT

If no signal from the combination meter can be received, KOS-ECU sets the DTC U0155.

TROUBLESHOOTING HINTS

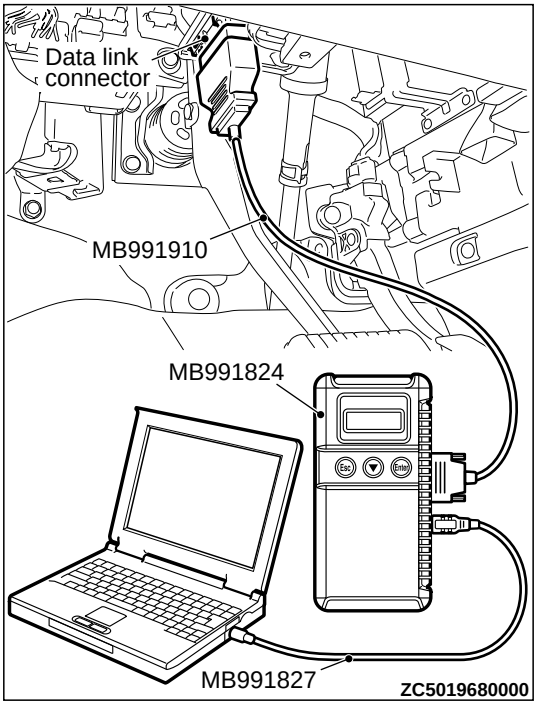
- Malfunction of CAN bus line
- Combination meter malfunction
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

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

Check if DTC is set to the combination meter.

Q:Is the DTC set?

YES: Troubleshoot the combination meter. (Refer to GROUP 54Ab, Diagnosis P.54Ab-7.)

NO: Go to Step 3.

STEP 3. Using scan tool MB991958, read the A/C-ECU diagnostic trouble code.
Check if the DTC U0155 is set to the A/C-ECU.

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

Q:Is the DTC set?
YES: Replace the combination meter.
NO: The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the combination meter and the ETACS-ECU. (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15)

STEP 5. Recheck for diagnostic trouble code.
Check again if the DTC is set to the KOS-ECU.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction such as a poor connection or open circuit in the CAN bus lines between the combination meter and the ETACS-ECU. (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-15)

DTC U0164: A/C-ECU CAN timeout

M14209100105USA0000010000

⚠ CAUTION
- **If the DTC U0164 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

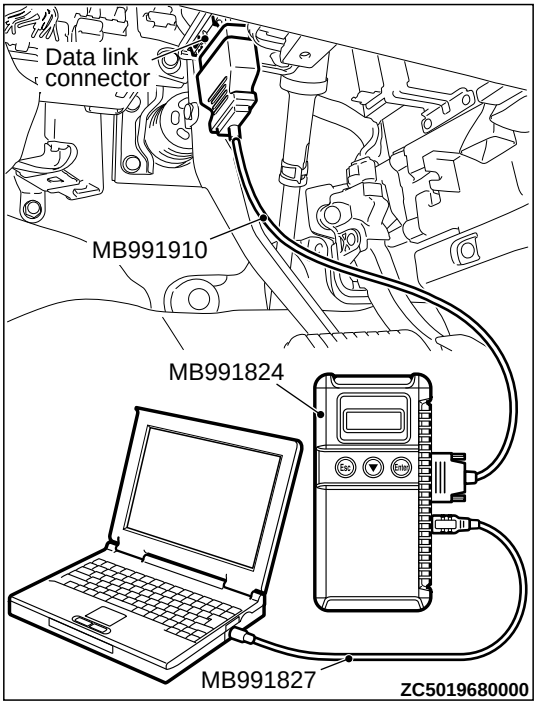
DIAGNOSTIC FUNCTION
If the signal from A/C-ECU cannot be received, the KOS-ECU sets the DTC U0164.

TROUBLESHOOTING HINTS
- The CAN bus line may be defective.
- The A/C-ECU may be defective.
- The KOS-ECU may be defective.

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

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

Check if DTC is set to the A/C-ECU.

Q:Is the DTC set?

YES: Troubleshoot the A/C (Refer to GROUP 55A, Manual A/C Diagnosis P.55A-8or GROUP 55B, Auto A/C Diagnosis P.55B-7).
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U0184: Audio CAN timeout

M14209100119USA0000010000

⚠ CAUTION

- **If the DTC U0184 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signals from radio and CD player or CD changer cannot be received, the KOS-ECU sets the DTC U0184.

TROUBLESHOOTING HINTS

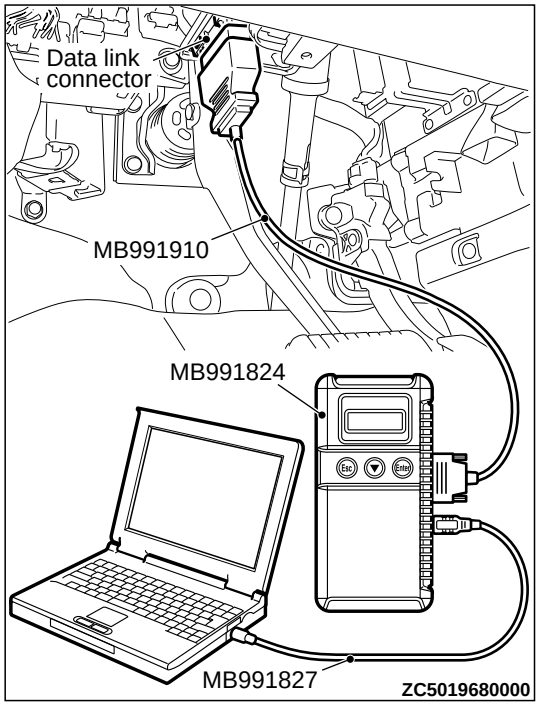
- The CAN bus line may be defective.
- The KOS-ECU may be defective.
- The radio and CD player or CD changer may be defective.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the audio diagnostic trouble code
Check again if the DTC is set to the audio.

Q:Is the DTC set?
YES: Troubleshoot the radio and CD player. Refer to GROUP 54B, Diagnosis <radio and CD player> P.54B-7.
NO: Go to Step 3.

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

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U0197: Hands free module CAN timeout

M14209100166USA0000010000

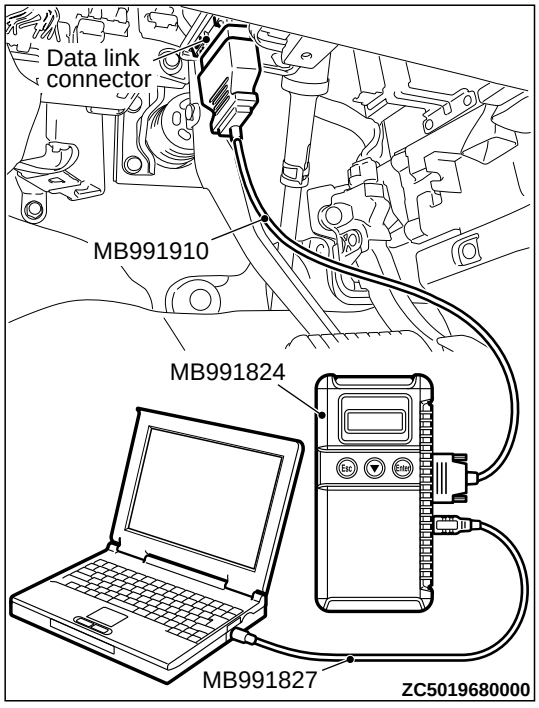
⚠ CAUTION
- **If the DTC U0197 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the signals from hands free module cannot be received, the KOS-ECU sets the DTC U0197.

TROUBLESHOOTING HINTS
- The CAN bus line may be defective.
- The KOS-ECU may be defective.
- The hands free module may be defective.

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)



STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the hands free module diagnostic trouble code

Check again if the DTC is set to the hands free module.

Q:Is the DTC set?

YES: Troubleshoot the hands-free cellular phone system. Refer to GROUP 54Ae, Diagnosis <hands-free cellular phone system>.
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U0245: Audio visual navigation unit CAN timeout

M14209100167USA0000010000

⚠ CAUTION

- **If the DTC U0245 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signals from audio visual navigation unit cannot be received, the KOS-ECU sets the DTC U0245.

TROUBLESHOOTING HINTS

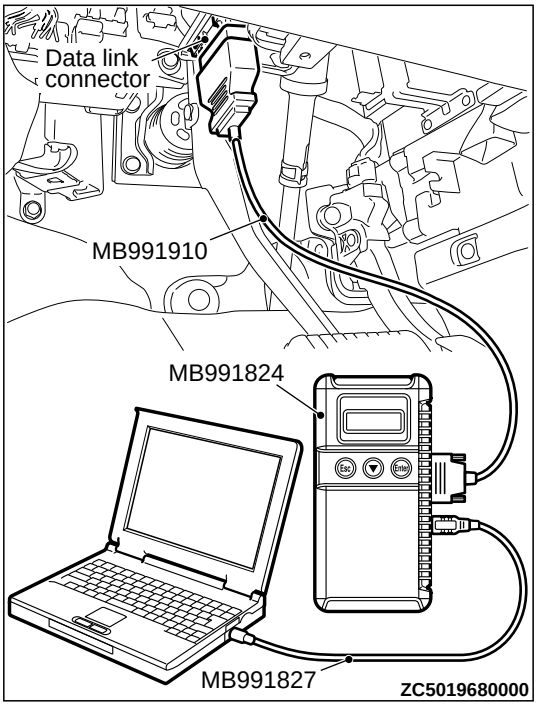
- The CAN bus line may be defective.
- The KOS-ECU may be defective.
- The audio visual navigation unit may be defective.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the audio visual navigation unit diagnostic trouble code.

Check if DTC is set to the audio visual navigation unit.

Q:Is the DTC set?

YES: Troubleshoot the MMCS. (Refer to GROUP 54B, Diagnosis <MMCS>.)
NO: Go to Step 3.

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

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

DTC U1412: Implausible Vehicle Speed Signal Received

M14209100150USA0000010000

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines. (Refer to GROUP 54D, Trouble code diagnosis P.54D-17).

TPMS DTC SET CONDITION
KOS-ECU receives the wheel speed information from ABS-ECU or ASC-ECU via the CAN-bus line. If KOS-ECU cannot receive the information about the wheel speed sensor from ABS-ECU or ASC-ECU, this code is set.

TROUBLESHOOTING HINTS
The most likely causes for this DTC to set are:
- Damaged wiring harness and connector
- Malfunction of ABS-ECU or ASC-ECU
- Malfunction of KOS-ECU

DIAGNOSIS

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

STEP 1. M.U.T.-III CAN bus diagnostics
Use scan tool to diagnose the CAN bus lines.

Q:Is the check result normal?
YES: Go to Step 3.
NO: Repair the CAN bus lines. (Refer to GROUP 54D - CAN Bus Diagnostics table P.54D-17.) On completion, go to Step 2.

STEP 2. Diagnostic trouble code recheck after resetting CAN bus lines
(1) Turn the ignition switch to the "LOCK" (OFF) position.
(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 diagnostic trouble code U1412 set?
YES: Go to Step 3.
NO: The procedure is complete.

STEP 3. Check for other diagnostic trouble code.
Check if the diagnostic trouble code is set from ABS-ECU or ASC-ECU.<Refer to GROUP 35B,diagnostic trouble code chart P.35B-9(vehicles without ASC) or Refer to GROUP 35C, diagnostic trouble code chart P.35C-11(vehicles with ASC)>

Q:Is the check result normal?
YES: Replace the KOS-ECU. Then go to Step 4.
NO: Carry out the troubleshooting for ABS-ECU or ASC-ECU.<Refer to GROUP 35B, diagnostic trouble code chart P.35B-9(vehicles without ASC) or Refer to GROUP 35C, diagnostic trouble code chart P.35C-11(vehicles with ASC)>. Then 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 "LOCK" (OFF) position.
(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 diagnostic trouble code U1412 reset?
YES: Start over at Step 1.
NO: The procedure is complete.

DTC U1415: Coding not completed/Data fail

M14209100106USA0000010000

⚠ CAUTION
- **If the DTC U1415 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
If the vehicle information data is not registered to the combination meter, the KOS-ECU sets the DTC U1415.

JUDGMENT CRITERIA

With the global coding counter value "0," if all the global coding data (vehicle information) are not stored, the KOS-ECU determines that a problem has occurred.

TROUBLESHOOTING HINTS

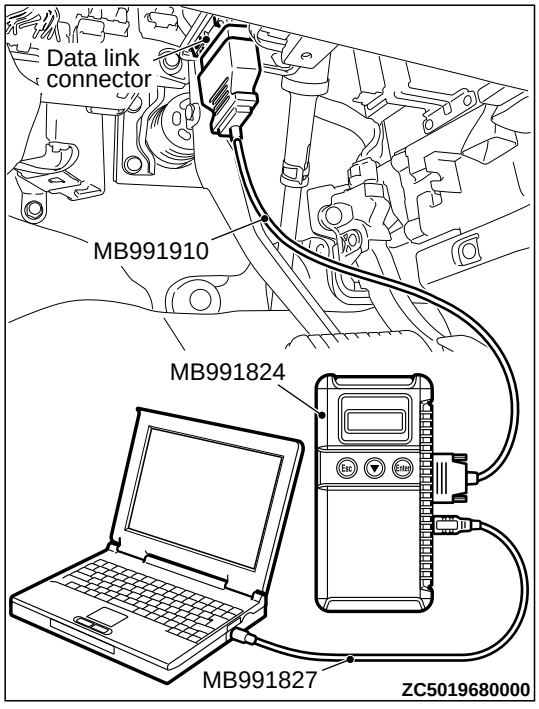
- The CAN bus line may be defective.
- The KOS-ECU may be defective.
- The ETACS-ECU may be defective.

DIAGNOSIS

Required Special Tools:

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

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the ETACS-ECU diagnostic trouble code.

Check if DTC is set to the ETACS-ECU.

Q:Is the DTC set?

YES: Troubleshoot the ETACS-ECU. Refer to P.54Ad-8.
NO: Go to Step 3.

STEP 3. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

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

Q:Is the DTC set?

YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

Code No.U1417 Implausible coding data

M14209100107USA0000010000

⚠ CAUTION

- **If diagnostic trouble code U1417 is set in KOS-ECU, always diagnose the CAN bus lines. If there is any fault in the CAN bus lines, an incorrect diagnostic trouble code may be set. In this case, the set diagnostic trouble code is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the diagnostic trouble code U1417 is set in KOS-ECU, the diagnostic trouble code may also be set in ETACS-ECU. When the diagnostic trouble code is set in ETACS-ECU, carry out the diagnosis of the diagnostic trouble code for ETACS-ECU first.**

CIRCUIT OPERATION

KOS-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

DTC SET CONDITIONS

KOS-ECU communicates with ETACS-ECU via CAN bus lines. This diagnostic trouble code is set when the vehicle information received from the ETACS-ECU is invalid.

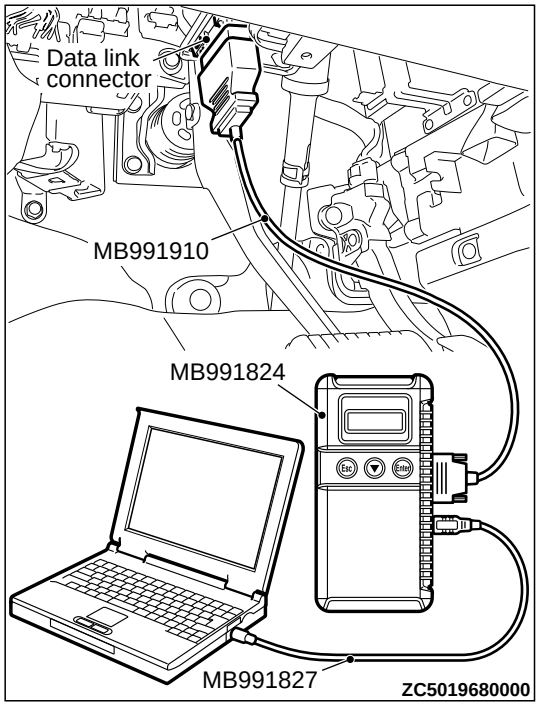
PROBABLE CAUSES

- Malfunction of ETACS-ECU
- Engine control module malfunction
- ETACS-ECUs have been interchanged between two vehicles.
- KOS-ECU malfunction
- External noise interference
- WCMs have been interchanged between two vehicles.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the other system diagnostic trouble code.

Check if DTC is set to the ETACS-ECU or engine control module.

Q:Is the DTC set?

YES (DTC is set to ETACS-ECU.): Troubleshoot the ETACS. (Refer to GROUP 54Ad, Diagnosis P.54Ad-8.)
YES (DTC is set to the engine control module.): Troubleshoot the MFI system. (Refer to GROUP 13Ab, Diagnosis P.13Ab-44.)
NO: Go to Step 3.

STEP 3. Check part number of ETACS-ECU.

Check the part number of ETACS-ECU.

OK: 8637A213

Q:Is the check result normal?

YES: Go to Step 4.
NO: Replace ETACS-ECU.

STEP 4. Check part number of KOS-ECU.

Check the part number of WCM.

OK: 8637A305

Q:Is the check result normal?

YES: Go to Step 5.
NO: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

STEP 5. Recheck for diagnostic trouble code.

Check again if the DTC is set to the KOS-ECU.

(1) Erase the DTC.

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

Q:Is the DTC set?
YES: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)
NO: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-3).

TROUBLE SYMPTOM CHART

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Trouble symptom	Inspection procedure number	Reference page
Cannot communicate with KOS-ECU using the scan tool.	1	P. 42B-109
Abnormality in KOS-ECU power supply and ground circuits	2	P. 42B-110
Keyless operation warning display does not disappear.	3	P. 42B-112
IG knob will not turn (keyless operation is not recognized).	4	P. 42B-114
The engine will not start with KOS (IG knob operates normally).	5	P. 42B-120
No Door will be Locked or Unlocked by Operating A Lock Switch On Any Door, or by touching The Unlock Sensor.	6	P. 42B-121
Driver's Door Lock Switch does not Work.	7	P. 42B-125
Driver's Door Unlock Sensor does not Work.	8	P. 42B-128
Front Passenger's Door Lock Switch does not Work.	9	P. 42B-130
Front Passenger's Door Unlock Sensor does not Work.	10	P. 42B-133
Lock Switch (Liftgate) does not Work.	11	P. 42B-136
Liftgate Lock Release Handle does not Work.	12	P. 42B-140
Keyless Entry System does not Work.	13	P. 42B-144
KOS Timer Lock Function does not Work.	14	P. 42B-150

Trouble symptom	Inspection procedure number	Reference page
The Dome Light and The Turn-signal Lights do not Operate through The Answerback Function.	15	P. 42B-151
Outer Tone alarm does not Sound.	16	P. 42B-153

SYMPTOM PROCEDURES

Inspection Procedure 1: Cannot communicate with KOS-ECU using the scan tool.

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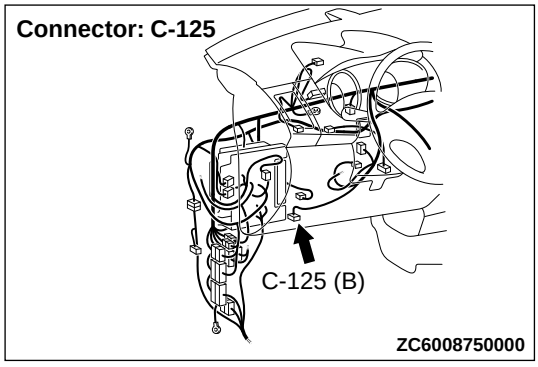

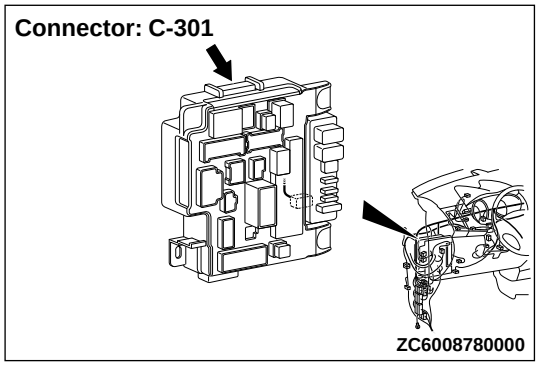

TROUBLESHOOTING HINTS
- Damaged wiring harness and connectors
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. V.C.I. status check

Check that the V.C.I. indicator light is illuminated in green.

Q:Is it illuminated in green?

YES: Diagnose the CAN bus line, and repair if necessary. (Refer to GROUP 54D, Diagnosis P.54D-17.)

NO: Go to Step 2.

STEP 2. Check ETACS-ECU connector C-301 and data link connector C-125 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the ETACS-ECU connector C-301 and data link connector C-125 in good condition?
YES: Go to Step 3.
NO: Repair the defective connector.

STEP 3. Check the wiring harness between the ETACS-ECU connector C-301 (terminal No. 4, 5) and the data link connector C-125 (terminal No. 14, 6).
- Check the power supply line for open circuit.

Q:Is the wiring harness between ETACS-ECU connector C-301 (terminal No. 4, 5) and the data link connector C-125 (terminal No. 14, 6) in good condition?
YES: Go to Step 4.
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.

STEP 4. Check the wiring harness between the data link connector C-125 (terminal No. 4, 5) and the ground.
- Check the ground wires for open circuit.

Q:Is the wiring harness between data link connector C-125 (terminal No. 4, 5) and the ground in good condition?
YES: Check the scan tool (M.U.T.-III). (Refer to M.U.T.-III User's Manual).
NO: Repair the wiring harness.

Inspection Procedure 2: Abnormality in KOS-ECU power supply and ground circuits

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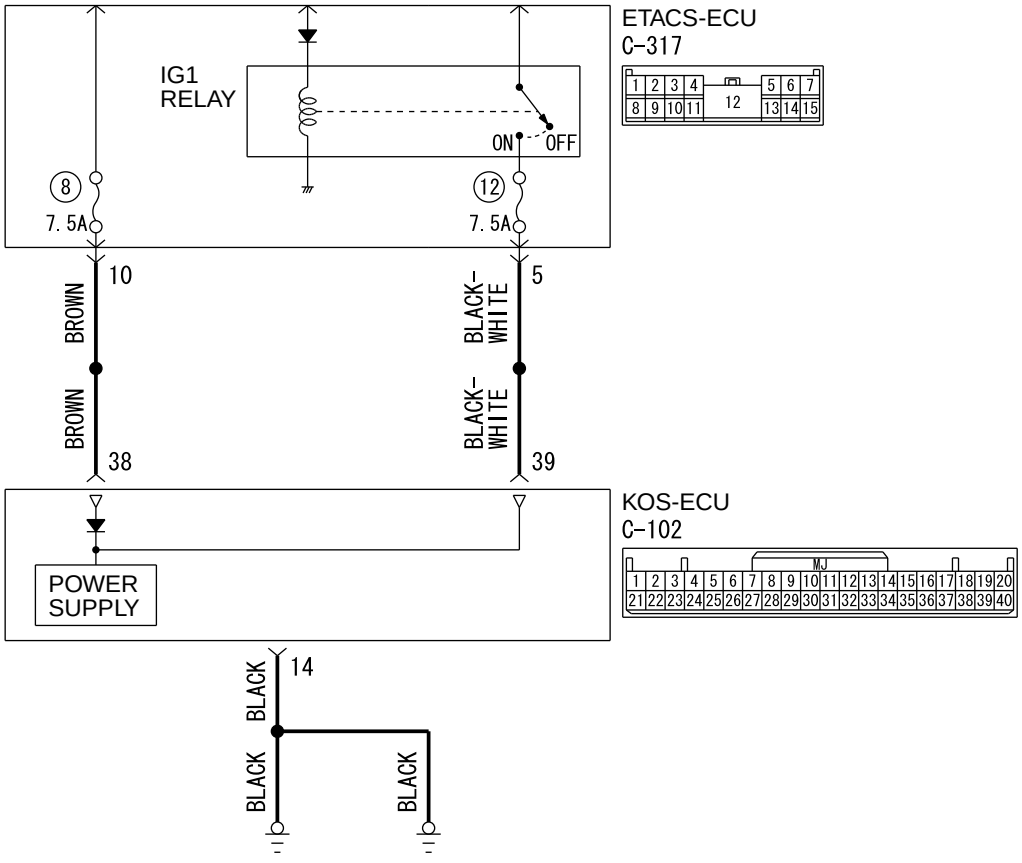
⚠ CAUTION

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

KOS-ECU Power Supply Circuit



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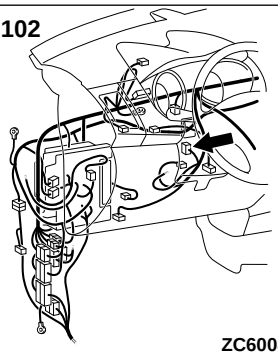
Connector: C-102



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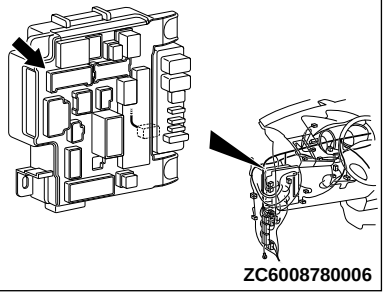
Connector: C-317



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TROUBLESHOOTING HINTS
- Damaged wiring harness and connectors
- Malfunction of KOS-ECU

STEP 1. Check KOS-ECU connector C-102 and ETACS-ECU connector C-317 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is the KOS-ECU connector C-102 and ETACS-ECU connector C-317 in good condition?
YES: Go to Step 2.
NO: Repair the defective connector.

STEP 2. Check the wiring harness between the KOS-ECU connector C-102 (terminal No. 38, 39) and the ETACS-ECU connector C-317 (terminal No. 10, 5).
- Check the power supply and ground wires for open circuit.

Q:Is the wiring harness between KOS-ECU connector C-102 (terminal No. 38, 39) and the ETACS-ECU connector C-317 (terminal No. 10, 5) in good condition?
YES: Go to Step 3.
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary.

STEP 3. Retest the system

Q:Does the abnormality in KOS-ECU power supply and ground circuits in good condition?
YES: The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
NO: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

Inspection Procedure 3: Keyless operation warning display does not disappear.

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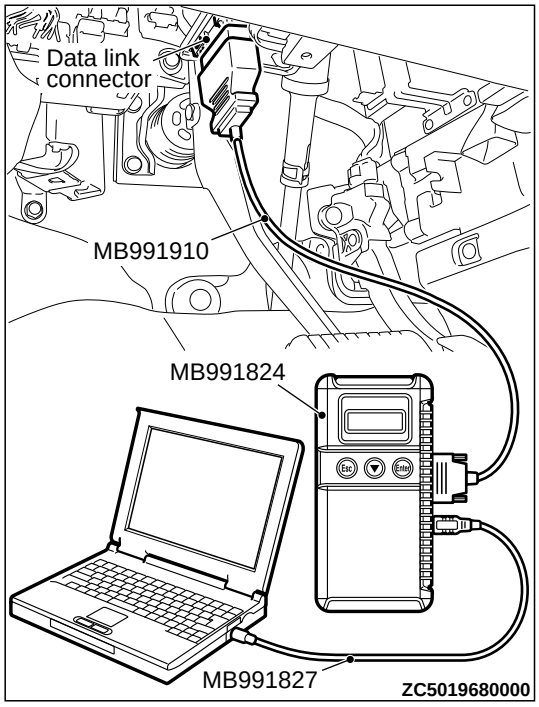
⚠ CAUTION
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

TROUBLESHOOTING HINTS
- Malfunction of CAN bus line
- Malfunction of combination meter
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable



- MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

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

Check the DTC B2415 is set to the KOS-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.

(1) Connect scan tool MB991958. Refer to "How to connect scan too (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check if DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC B2415 is set?

YES: Refer to P.42B-75.
NO: Go to Step 2.

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

Check if DTC is set in the combination meter.

Q:Is the DTC set?

YES: Troubleshoot the combination meter. (Refer to GROUP 54Ab, Diagnosis .)
NO: Go to Step 3.

STEP 3. Using scan tool MB991958, read the KOS-ECU trouble code.

Check if DTC is set to the KOS-ECU.

Q:Is the DTC set?

YES: Refer to P.42B-18.
NO: Go to Step 4.

STEP 4. Check of the troubles.

Check that the keyless operation warning display turns OFF unless the flashing or illumination conditions are met.

Q:Is the DTC set?

YES: The trouble can be an intermittent malfunction (Refer to GROUP 00 - How to use Troubleshooting/ inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
NO: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

Inspection Procedure 4: IG knob will not turn (keyless operation is not recognized).

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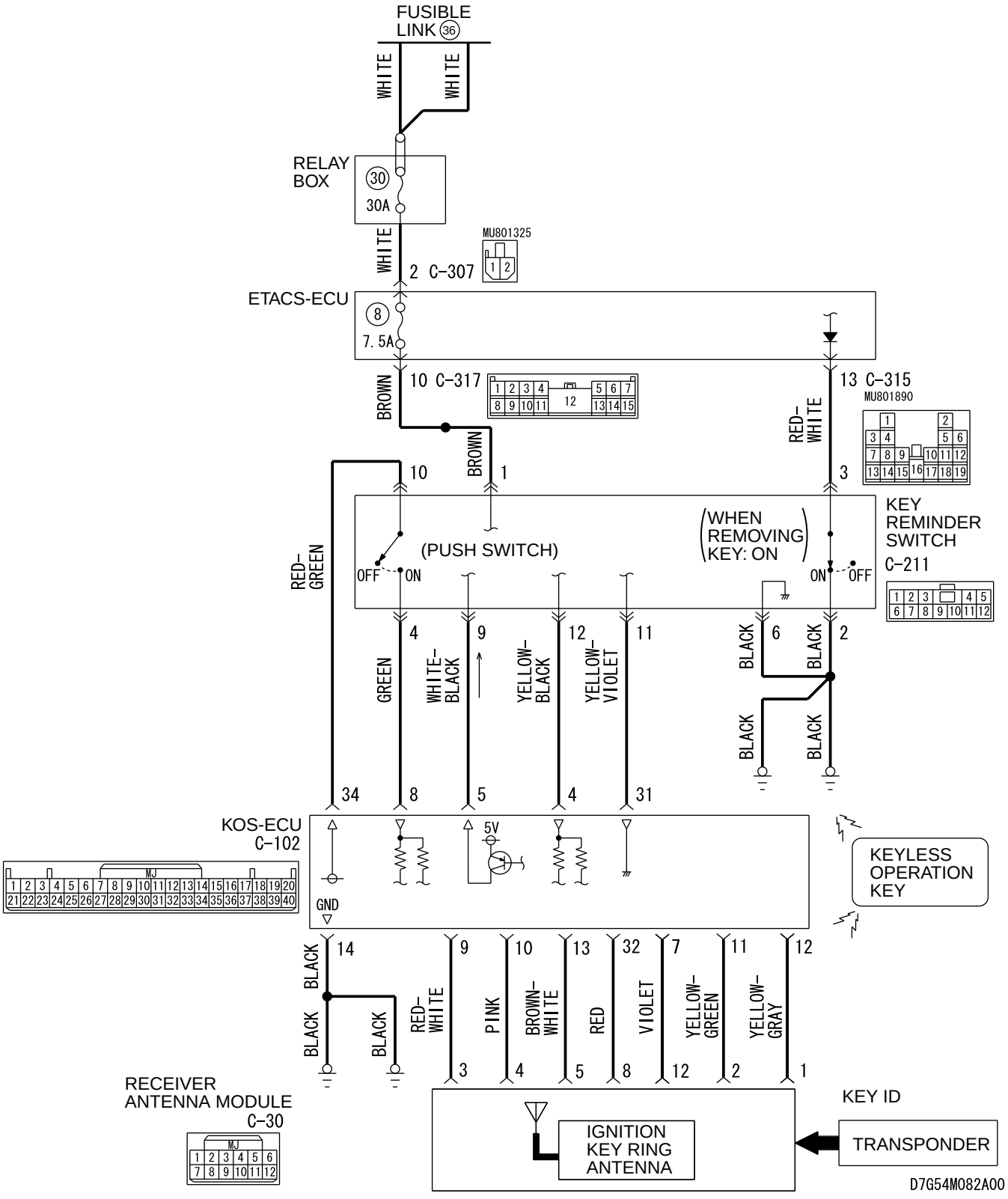
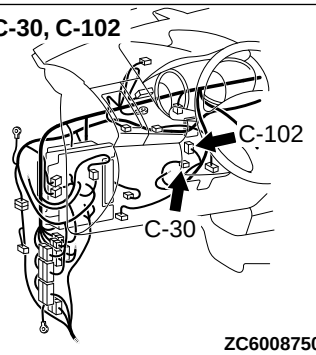
⚠ CAUTION

Before replacing the ECU, ensure that the communication circuit is normal.

KOS-ECU System Circuit



Connectors: C-30, C-102



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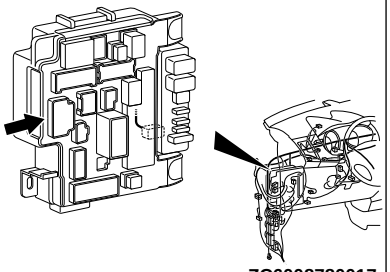
Connector: C-315



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TROUBLESHOOTING HINTS

- Configration function setting
- Damaged wiring harness and connectors
- Malfunctions of the steering lock push switch
- Malfunction of the keyless operation key
- Malfunction of the receiver antenna module
- Malfunction of KOS-ECU

DIAGNOSIS

Required Special Tools:

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

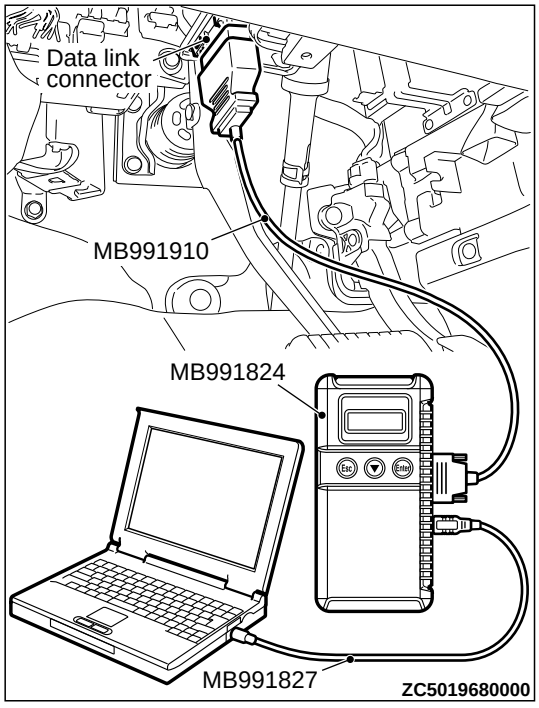
STEP 1. Check the power supply circuit and the ground circuit to KOS-ECU.

Refer to Inspection procedure 2 "Abnormality in KOS-ECU power supply and ground circuits" P.42B-110.

Q:Is the power supply circuit and the ground circuit to KOS-ECU in good condition?

YES: Go to Step 2.

NO: Repair the power supply circuit and the ground circuit to KOS-ECU.



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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect the Scan Tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES: Go to Step 3.
NO: Repair the CAN bus line. (Refer to GROUP 54D, Diagnosis P.54D-17).

STEP 3. Using scan tool MB991958, read the KOS-ECU diagnostic trouble code.

Check if DTC is set to the KOS-ECU.

Q:Is the DTC set?

YES: Troubleshoot the KOS. (Refer to P.42B-18.)
NO: Go to Step 4.

STEP 4. Using scan tool MB991958, Check the configuration function.

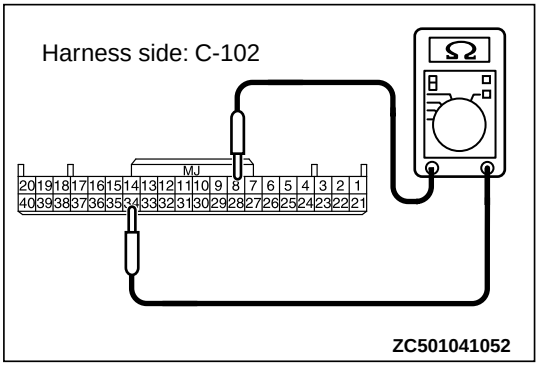
Use the ETACS-ECU configuration function to check that the "KOS feature" is set to "Both enable" or "ENG strt enable".

Q:Is it set to "Both enable" or "ENG strt enable"?

YES: Go to Step 5.
NO: Use the ETACS-ECU configuration function to set the "KOS feature" to "Both enable" or "ENG strt enable". (Refer to P.42B-157).

STEP 5. Check the ignition push switch. Measure the resistance at KOS-ECU connector C-102.

(1) Disconnect the KOS-ECU connector C-102.
(2) With the IG knob push switch pressed, measure the resistance at the harness-side connector.

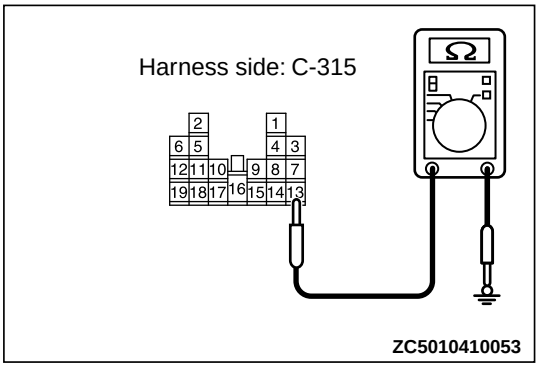


(3) Resistance between the KOS-ECU connector C-102 terminal No. 8 and 34.
OK: The resistance should be 2 Ω or less.

Q:Is the measured resistance 2 Ω or less?
YES: Go to Step 6.
NO: Check the KOS-ECU C-102 connector, the key reminder switch connector C-211, the ETACS-ECU connector C-317, and the wiring harness between the KOS-ECU connector C-102 (terminal No. 8, 34) and the C-211 key reminder switch connector (terminal No. 4, 10), and between the key reminder switch connector C-211 (terminal No. 1) and the ETACS-ECU connector C-317 (terminal No. 10), and repair them if necessary. If they are normal, replace the key reminder switch.

STEP 6. Check the key reminder switch. Measure the resistance at ETACS-ECU connector C-315.

(1) Disconnect the ETACS-ECU connector C-315.
(2) Measure the resistance at the harness-side connector with the ignition key removed from the ignition key cylinder.
(3) Resistance between the ETACS-ECU connector C-315 terminal No. 13 and the ground.
OK: The resistance should be 2 Ω or less.



Q:Is the measured resistance 2 Ω or less?
YES: Go to Step 7.
NO: Check the key reminder switch connector C-211, the ETACS-ECU connector C-315, the wiring harness between the key reminder switch connector C-211 (terminal No. 3) and the ETACS-ECU connector C-315 (terminal No. 13), and between the key reminder switch connector C-211 (terminal No. 2) and the ground. If they are normal, replace the key reminder switch.

STEP 7. Check with another registered keyless operation key.

Q:Does the IG knob turn? (Is the keyless operation key recognised?)
YES: Replace the keyless operation key with which the IG knob does not turn (no recognition) and register the ID codes. (Refer to P.42B-12.)
NO: Go to Step 8.

STEP 8. Check KOS-ECU connector C-102 and receiver antenna module connector C-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is KOS-ECU connector C-102 and receiver antenna module connector C-30 in good condition?
YES: Go to Step 9.
NO: Repair the defective connector.

STEP 9. Check the wiring harness between KOS-ECU connector C-102 (terminal No. 11, 12, 32) and receiver antenna module connector C-30 (terminal No. 2, 1, 8).

Q:Is the wiring harness between KOS-ECU connector C-102 (terminal No. 11, 12, 32) and receiver antenna module connector C-30 (terminal No. 2, 1, 8) in good condition?

YES: Go to Step 10.

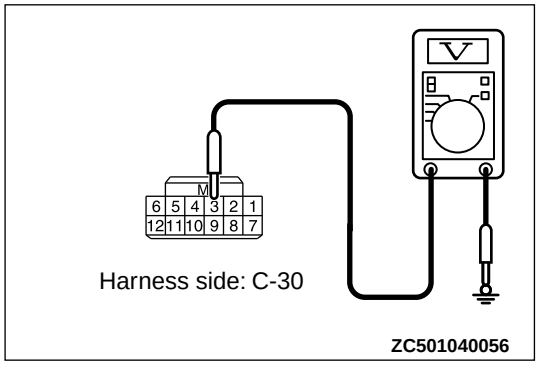
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Verify that the high-beam headlights illuminate normally.

STEP 10. Check the power supply circuit to the reciever antenna module. Measure the voltage at reciever antenna module connector C-30.

(1) Disconnect reciever antenna module connector C-30 and measure the voltage available at the harness side of the connector.

(2) Measure the voltage between terminal No. 3 and ground.

- The voltage should measure 5 volt.



Q:Is the measured voltage 5 volt?

YES: Go to Step 11.

NO: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

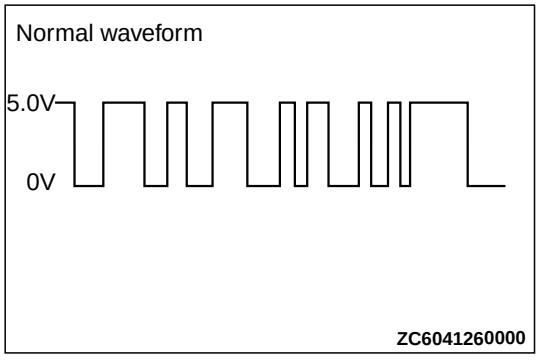
STEP 11. Using the oscilloscope, check the waveform at receiver antenna module connector C-30 and ground by backprobing.

(1) Do not disconnect the receiver antenna module connector C-30.

(2) Connect an oscilloscope to receiver antenna module connector C-30 terminal No. 3 and ground by backprobing.

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

- Check the waveform.



Q:Is the waveform normal?

YES: Go to Step 12.

NO: Replace the receiver antenna module.

STEP 12. Check of the troubles.

Check that the IG turns (keyless operation is recognised).

Q:Dose the IG knob will not turn (keyless operation is not recognized) in good condition?

YES: The procedure is complete.
NO: Replace KOS-ECU and register the ID codes. (Refer to P.42B-12.)

Inspection Procedure 5: The engine will not start with KOS (IG knob operates normally).

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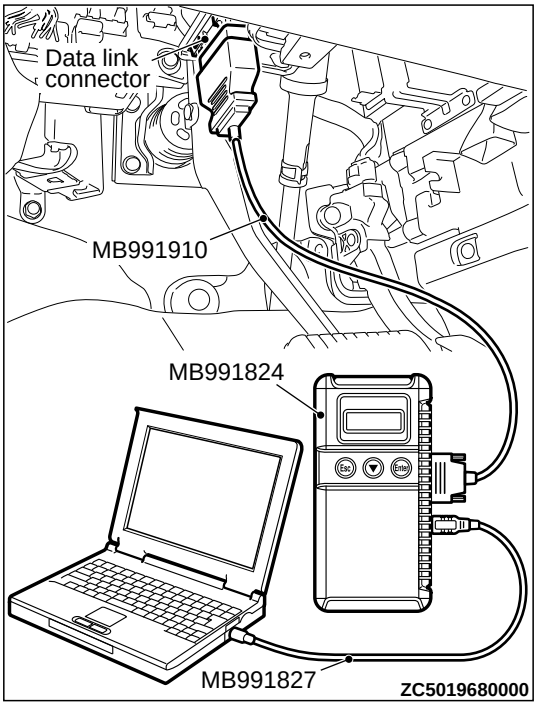
⚠ CAUTION
Before replacing the ECU, ensure that the communication circuit is normal.

TROUBLESHOOTING HINTS
- The CAN bus line is defective.
- Malfunction of the MFI system
- Function setting error or no setting with customization
- VIN not written or unmatched

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

STEP 1. Using scan tool MB991958, 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 the Scan Tool (M.U.T.-III) P.42B-10."
(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 54D, Diagnosis P.54D-17).

STEP 2. Using scan tool MB991958, read the KOS-ECU diagnostic trouble code.
Check if DTC is set to the KOS-ECU.

Q:Is the DTC set?
YES: Troubleshoot the KOS. (Refer to P.42B-18.)
NO: Go to Step 3.

STEP 3. Using scan tool MB991958, Check the configuration function.

Use the ETACS-ECU configuration function to check that the "KOS feature" is set to "Both enable" or "ENG strt enable".

(1) Turn the ignition switch to the "ON" position.
(2) Use the ETACS-ECU configuration function to check that the "KOS feature" is set to "Both enable" or "ENG strt enable".
(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is it set to "Both enable" or "ENG strt enable"?

YES: Go to Step 4.
NO: Use the ETACS-ECU configuration function to set the "KOS feature" to "Both enable" or "ENG strt enable". (Refer to P.42B-170.)

STEP 4. Check that the engine starts.

Q:Does the engine start?

YES: The procedure is complete.
NO: Refer to GROUP 13Ab - Troubleshooting P.13Ab-44.

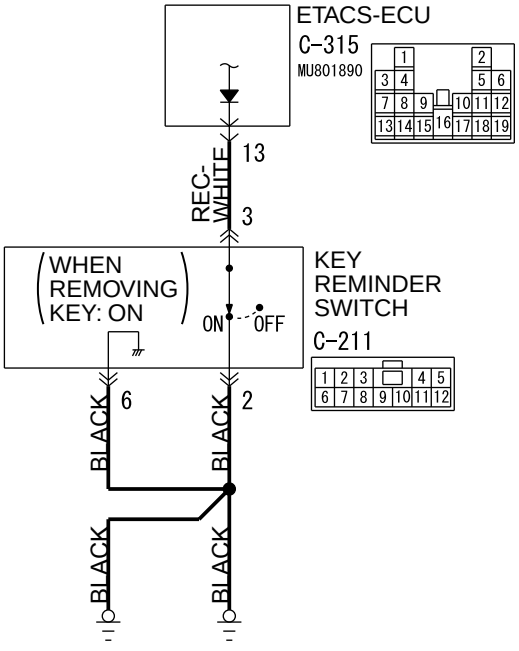
INSPECTION PROCEDURE 6: No Door will be Locked or Unlocked by Operating A Lock Switch On Any Door, or by touching The Unlock Sensor.

M14209100109USA0000010000

⚠ CAUTION

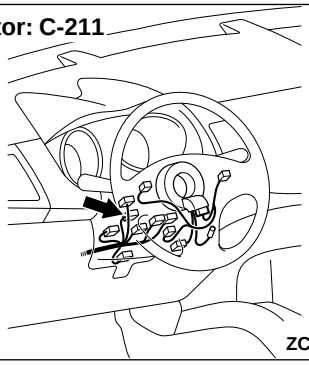
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

ETACS-ECU and Key Reminder Switch Circuit



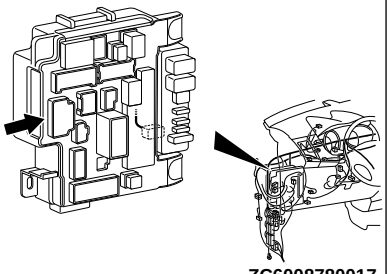
ZC6031270000

Connector: C-211



ZC6008770002

Connector: C-315



ZC6008780017

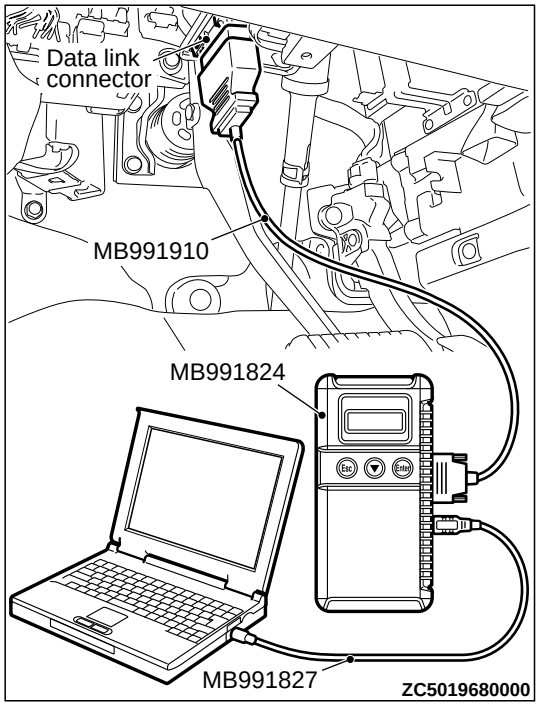
PROBABLE CAUSES

- Malfunction of the CAN bus lines
- Malfunction of the central door locking system
- Malfunction of the keyless operation key
- Malfunction of the key reminder switch
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU
- Function setting error or no setting with a customization

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



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

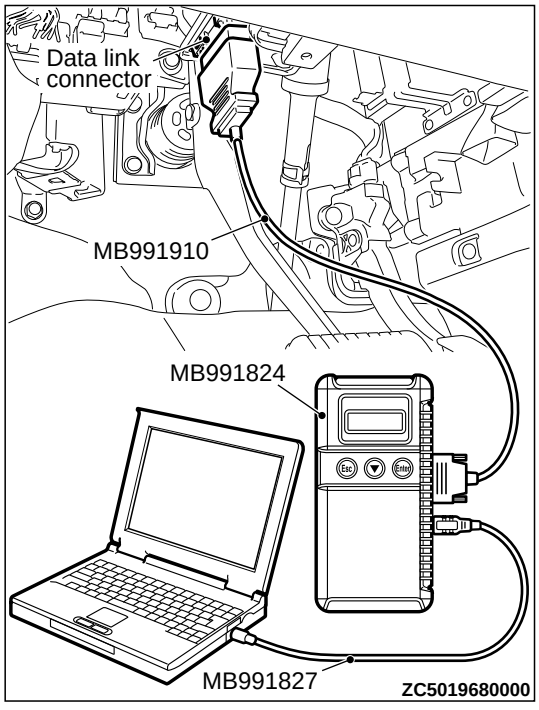
⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the CAN bus lines related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Repair the CAN bus line (Refer to GROUP 54D, CAN bus diagnostics table P.54D-17).
NO: Go to Step 2.



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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 3.

STEP 3. Check the central door locking system operation

Check that the central door locking system works normally.

Q:Is the check result normal?

YES: Go to Step 4.

NO: Perform troubleshooting for the central door locking system (Refer to GROUP 42Ab, Trouble symptom chart P. 42Ab-11).

STEP 4. Check the customize function.

Check that either of the followings other than "ENG strt enable" or "Both disabled" are set for "KOS feature" with the customization function.

- Both enable
- Door Entry enable

Q:Is the check result normal?

YES: Go to Step 5.

NO: Set either of the followings other than "ENG strt enable" or "Both disabled" for "KOS feature" with the customization function (Refer to P.42B-170).

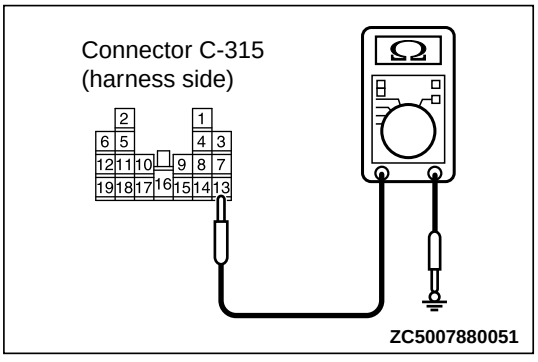
STEP 5. Key reminder switch check.

(1) Disconnect the C-315 ETACS-ECU connector.

(2) Measure the resistance at the harness-side connector with the ignition key removed from the ignition key cylinder.

(3) Check for continuity between the C-315 ETACS-ECU connector terminal No. 13 and the ground.

OK: Continuity exists (2 Ω or less)



Q:Is the check result normal?

YES: Go to Step 6.

NO: Check the C-209 key reminder switch connector, the C-315 ETACS-ECU connector, the wiring harness between the C-211 key reminder switch connector (terminal No. 3) and the C-315 ETACS-ECU connector (terminal No. 13), and between the C-211 key reminder switch connector (terminal No. 2) and the ground. If they are normal, replace the key reminder switch.

STEP 6. Check with another registered keyless operation key.

Q:Does the IG knob turn? (Is the keyless operation key recognised?)

YES: Replace the keyless operation key with which the IG knob does not turn (no recognition) and register the ID codes (Refer to P.42B-163).

NO: Go to Step 7.

STEP 7. Check of the troubles.

Operate the lock switch and check that the door can be locked and unlocked. Also, check that the unlock sensor can lock and unlock the door.

Q:Is the check result normal?

YES: The procedure is complete.

NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

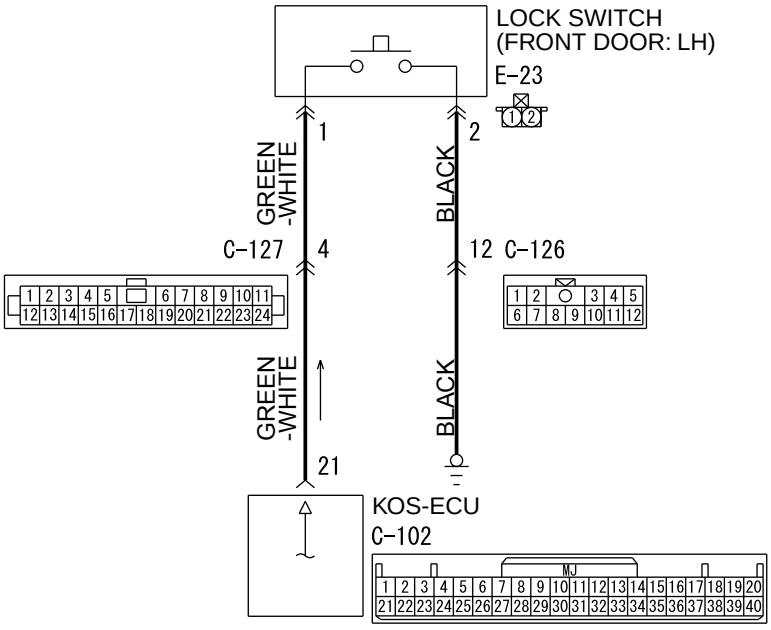
INSPECTION PROCEDURE 7: Driver's Door Lock Switch does not Work.

M14209100110USA0000010000

⚠ CAUTION

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

Lock switch (Front Door: LH) Circuit



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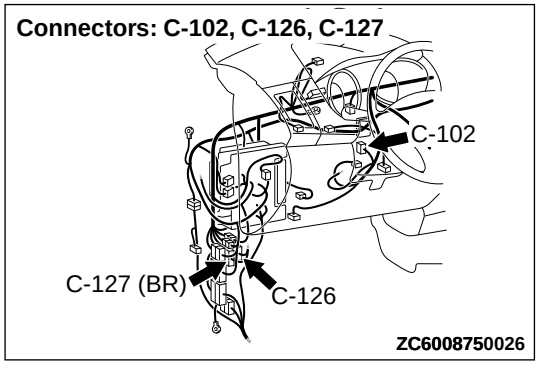
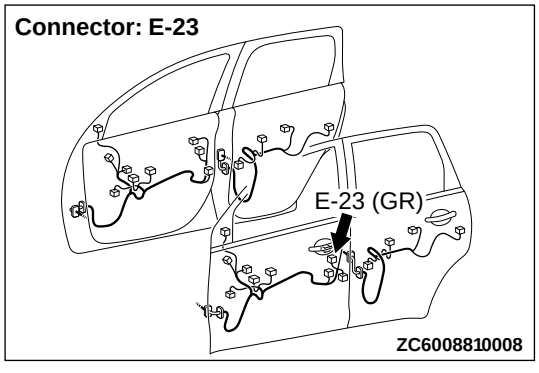


ZC6008750026



ZC6008810008

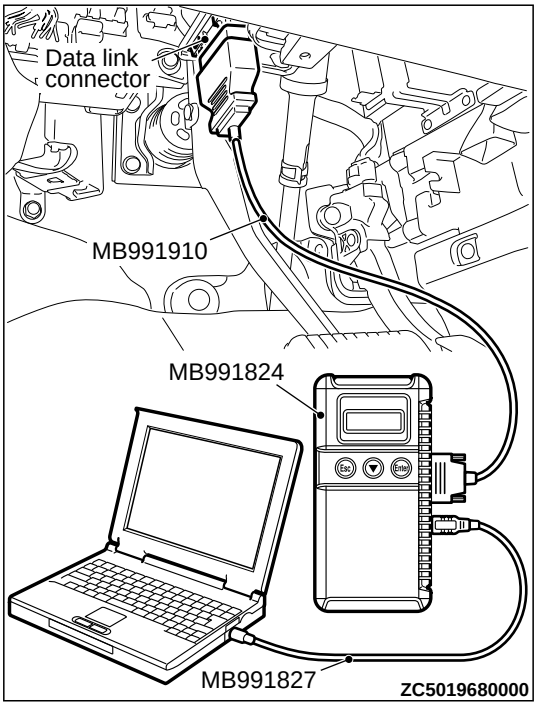
PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (driver's side)
- Malfunction of the lock switch (front door: LH)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

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



⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 and lock switch (front door: LH) connector E-23 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and lock switch (front door: LH) connector E-23 in good condition?

YES: Go to Step 3.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the driver's door lock switch works normally.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal No. 21) and lock switch (front door: LH) connector E-23 (terminal No. 1) and lock switch (front door: LH) connector E-23 (terminal No. 2) and ground.

NOTE: Also check intermediate connector C-126 and C-127 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-126 and C-127 is damaged, repair or replace the damaged component

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

Q:Are the wiring harness between KOS-ECU connector C-102 (terminal No. 21) and lock switch (front door: LH) connector E-23 (terminal No. 1) and lock switch (front door: LH) connector E-23 (terminal No. 2) and ground in good condition?

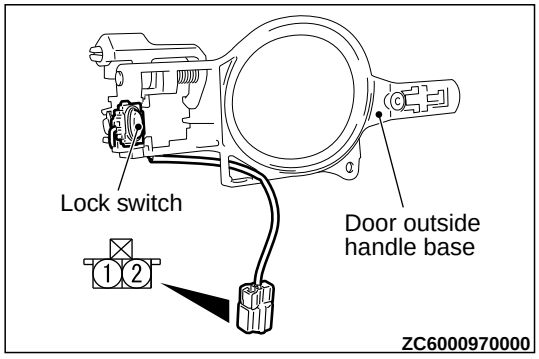
YES: Go to Step 4.

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

STEP 4. Lock switch (front door: LH) check.

(1) Remove the door outside handle base (Refer to GROUP 42Ab, Door Handle and Latch P.42Ab-102).

(2) Check continuity when the lock switch (front door: LH) is operated to "ON" or "OFF" position.



Switch position	Terminal number	Normal value
ON	1 - 2	Continuity exists (2 Ω or less)
OFF	1 - 2	Open circuit

Q:Is the lock switch (front: LH) normal?

YES: Go to Step 5.

NO: Replace the door outside handle base. Check that the driver's door lock switch works normally.

STEP 5. KOS communication test

Using scan tool (M.U.T-III), perform the antenna communication test to check that the exterior transmitter antenna (driver's side) communicates normally (Refer to P.42B-169).

Q:Is the check result normal?

YES: Go to Step 6.

NO: Perform troubleshooting for the diagnostic trouble code No. B240A (Refer to P.42B-18).

STEP 6. Check of the troubles.

Operate the lock switch (front door: LH) and check that the door and liftgate can be locked.

Q:Is the check result normal?

YES: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P.00-15).

NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

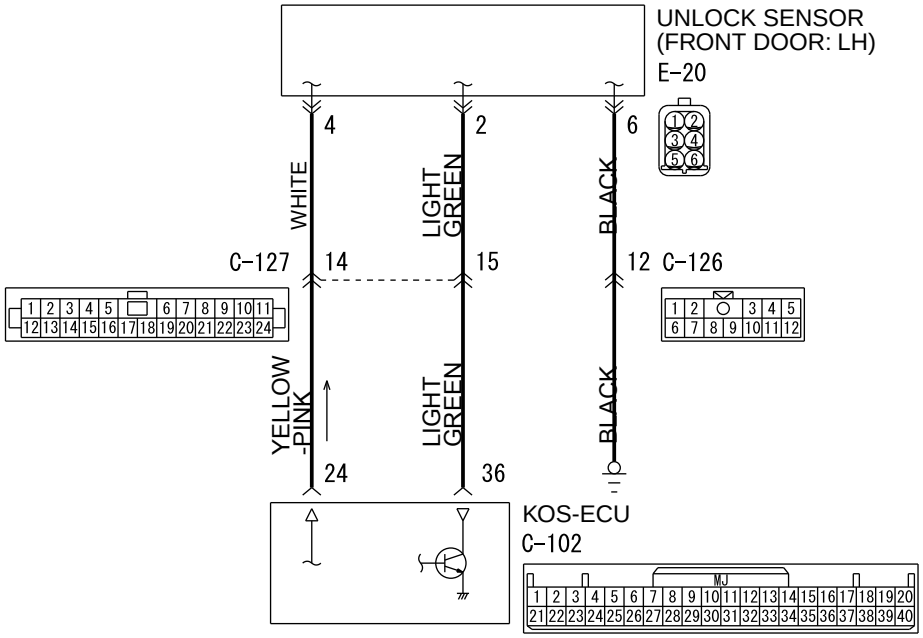
INSPECTION PROCEDURE 8: Driver's Door Unlock Sensor does not Work.

M14209100111USA0000010000

⚠ CAUTION

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

Unlock Sensor (Front Door: LH) Circuit



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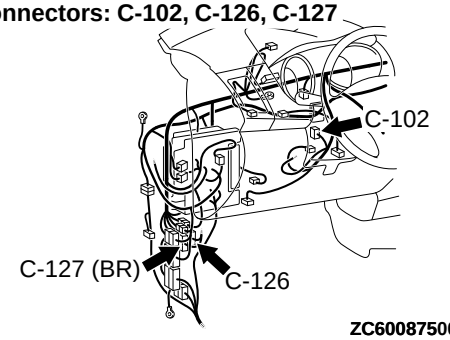
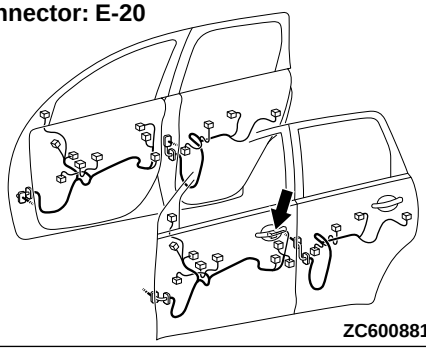
Connectors: C-102, C-126, C-127



ZC6008750026

Connector: E-20



ZC6008810009

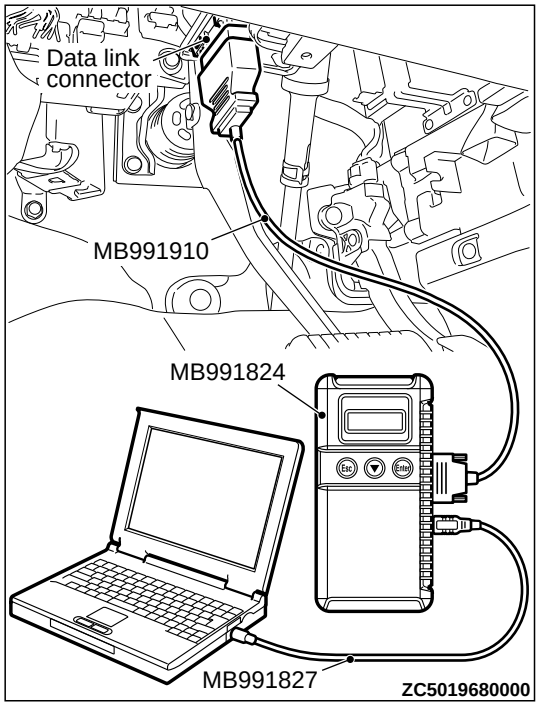
PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (driver's side)
- Malfunction of the unlock sensor (front door: LH)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

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



⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 and unlock sensor (front door: LH) connector E-20 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and unlock sensor (front door: LH) connector E-20 in good condition?

YES: Go to Step 3.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the driver's door unlock sensor works normally.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 24 and 36) and unlock sensor (front door: LH) connector E-20 (terminal Nos. 4 and 2) and unlock sensor connector E-20 (terminal No. 6) and ground.

NOTE: Also check intermediate connector C-126 and C-127 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-126 and

C-127 is damaged, repair or replace the damaged component (s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q:Are the wiring harness between KOS-ECU connector C-102 (terminal Nos. 24 and 36) and unlock sensor (front door: LH) connector E-20 (terminal Nos. 4 and 2) and unlock sensor connector E-20 (terminal No. 6) and ground in good condition?

YES: Go to Step 4.

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

STEP 4. KOS communication test.

Using scan tool (M.U.T-III), perform the antenna communication test to check that the exterior transmitter antenna (driver's side) communicates normally (Refer to P.42B-169).

Q:Is the check result normal?

YES: Go to Step 5.

NO: Perform troubleshooting for the diagnostic trouble code No. B240A (Refer to P.42B-18).

STEP 5. Check of the troubles.

Operate the unlock sensor (front door: LH) and check that the door and liftgate can be locked.

Q:Is the check result normal?

YES: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P.00-15).

NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

INSPECTION PROCEDURE 9: Front Passenger's Door Lock Switch does not Work.

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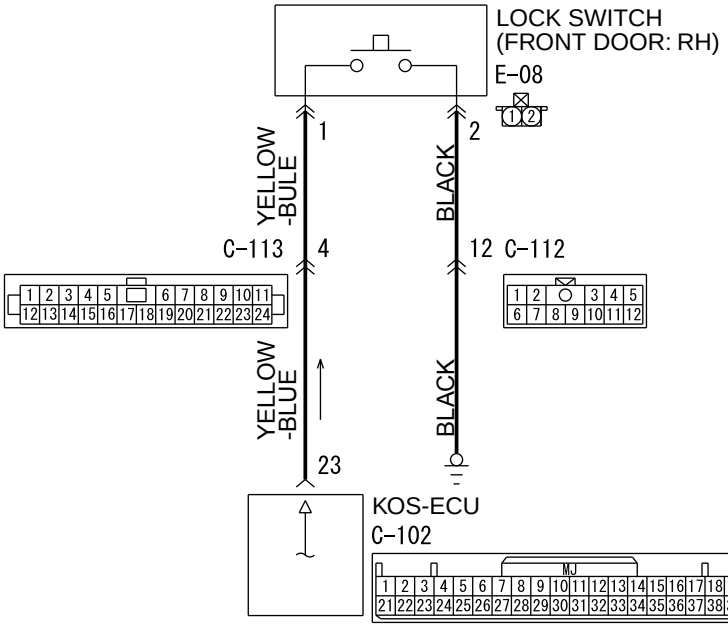
⚠ CAUTION

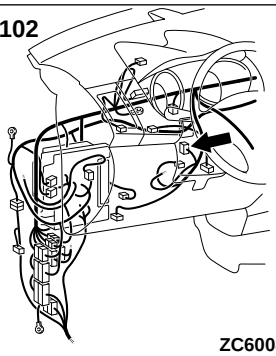
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Lock switch (Front Door: RH) Circuit



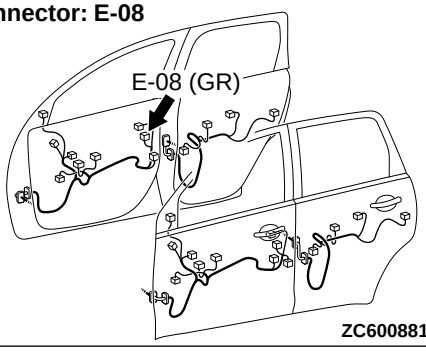
ZC6031300000

Connector: C-102



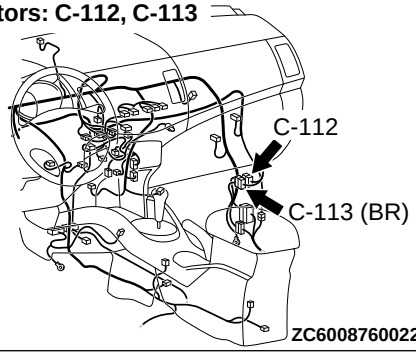
ZC6008750028

Connector: E-08



ZC6008810010

Connectors: C-112, C-113



ZC6008760022

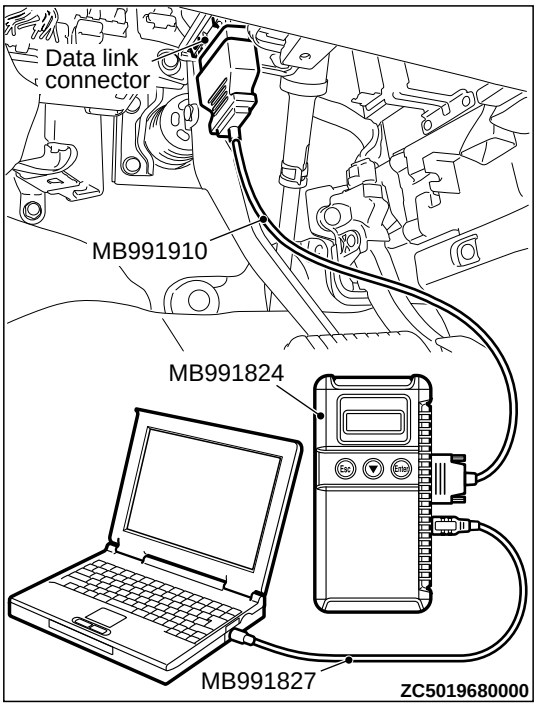
PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (front passenger's side)
- Malfunction of the lock switch (front door: RH)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable



▪MB991910: M.U.T.-III Main Harness A

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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 and lock switch (front door: RH) connector E-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and lock switch (front door: RH) connector E-08 in good condition?
YES: Go to Step 3.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the front passenger's door lock switch works normally.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal No. 23) and lock switch (front door: RH) connector E-08 (terminal No. 1) and lock switch (front door: RH) connector E-08 (terminal No. 2) and ground.
NOTE: Also check intermediate connector C-112 and C-113 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-112 and C-113 is damaged, repair or replace the damaged component (s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

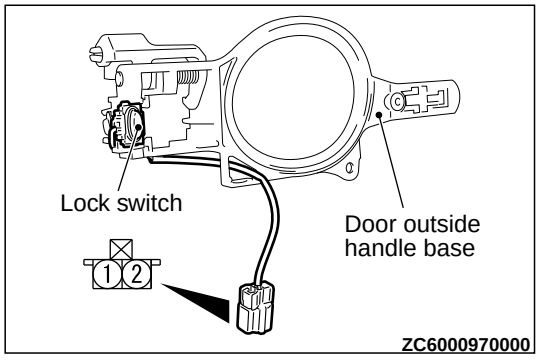
Q:Are the wiring harness between KOS-ECU connector C-102 (terminal No. 23) and lock switch (front door: RH) connector E-08 (terminal No. 1) and lock switch (front door: RH) connector E-08 (terminal No. 2) and ground in good condition?
YES: Go to Step 4.

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

STEP 4. Lock switch (front door: RH) check.

(1) Remove the door outside handle base (Refer to GROUP 42Ab, Door Handle and Latch P.42Ab-102).

(2) Check continuity when the lock switch (front door: RH) is operated to "ON" or "OFF" position.



Switch position	Terminal number	Normal value
ON	1 - 2	Continuity exists (2 Ω or less)
OFF	1 - 2	Open circuit

Q:Is the lock switch (front: RH) normal?

YES: Go to Step 5.

NO: Replace the door outside handle base. Check that the front passenger's door lock switch works normally.

STEP 5. KOS communication test.

Using scan tool (M.U.T.-III), perform the antenna communication test to check that the exterior transmitter antenna (front passenger's door) communicates normally (Refer to P. 42B-169).

Q:Is the check result normal?

YES: Go to Step 6.

NO: Perform troubleshooting for the diagnostic trouble code No. B240B (Refer to P.42B-18).

STEP 6. Check of the troubles.

Operate the lock switch (front passenger's side) to check that the door can be locked.

Q:Is the check result normal?

YES: Intermittent malfunction is suspected. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P. 00-15).

NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

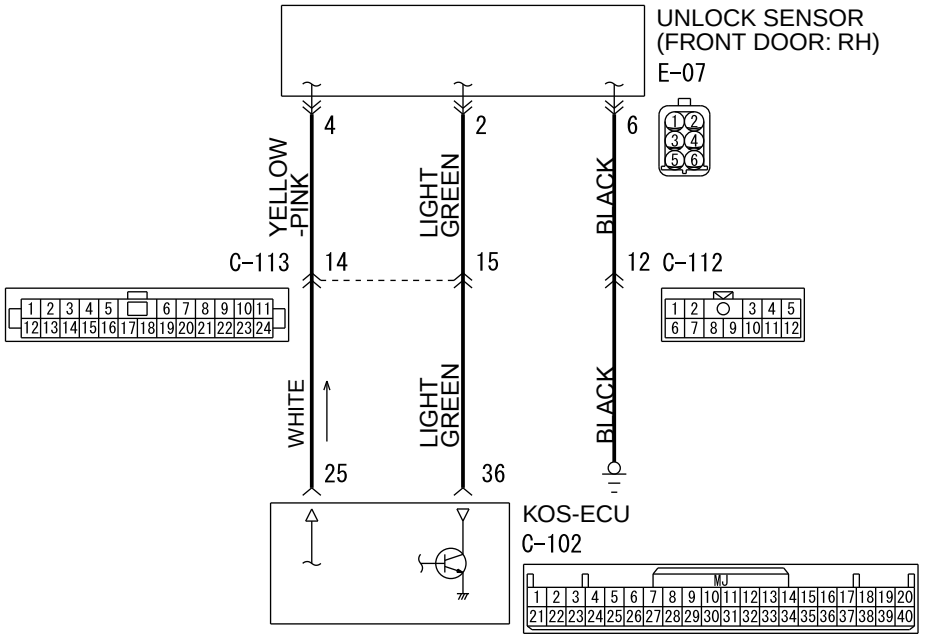
INSPECTION PROCEDURE 10: Front Passenger's Door Unlock Sensor does not Work.

M14209100113USA0000010000

⚠ CAUTION

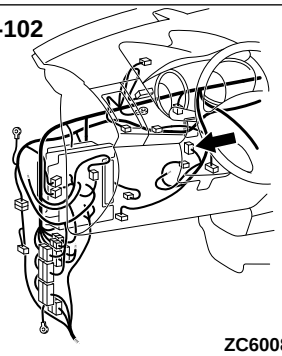
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Unlock Sensor (Front Door: RH) Circuit



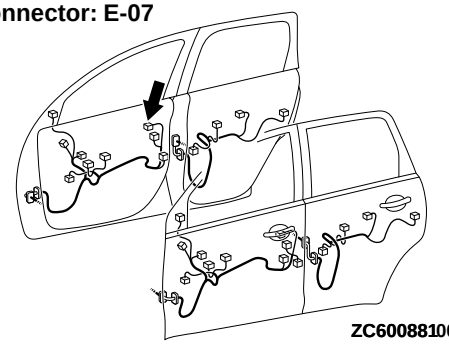
ZC6031310000

Connector: C-102



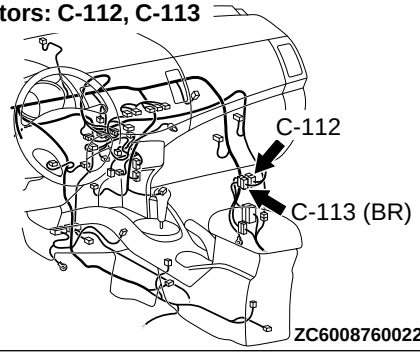
ZC6008750028

Connector: E-07



ZC6008810011

Connectors: C-112, C-113



ZC6008760022

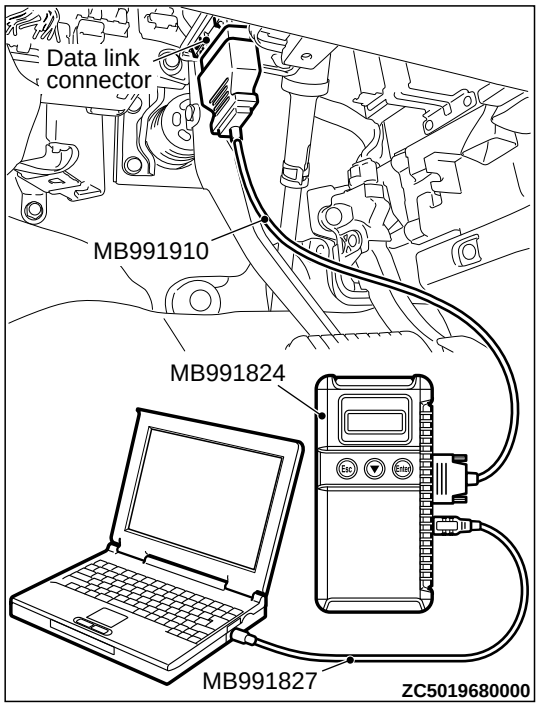
PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (front passenger's side)
- Malfunction of the unlock sensor (front door: RH)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable



・MB991910: M.U.T.-III Main Harness A

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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 and unlock sensor (front door: RH) connector E-07 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and unlock sensor (front door: RH) connector E-07 in good condition?
YES: Go to Step 3.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the front passenger's door unlock sensor works normally.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 25 and 36) and unlock sensor (front door: RH) connector E-07 (terminal Nos. 4 and 2) and unlock sensor (front: RH) connector E-07 (terminal No. 6) and ground.

NOTE: Also check intermediate connector C-112 and C-113 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-112 and C-113 is damaged, repair or replace the damaged component (s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q:Are the wiring harness between KOS-ECU connector C-102 (terminal Nos. 25 and 36) and unlock sensor (front door: RH) connector E-07 (terminal Nos. 4 and 2) and unlock sensor (front: RH) connector E-07 (terminal No. 6) and ground in good condition?

YES: Go to Step 4.
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the front passenger's door unlock sensor works normally.

STEP 4. KOS communication test

Using scan tool (M.U.T.-III), perform the antenna communication test to check that the exterior transmitter antenna (front passenger's door) communicates normally (Refer to P. 42B-169).

Q:Is the check result normal?
YES: Go to Step 5.
NO: Perform troubleshooting for the diagnostic trouble code No. B240B (Refer to P.42B-18).

STEP 5. Check of the troubles

Operate the unlock sensor (front door: RH) and check that the door and liftgate can be locked.

Q:Is the check result normal?
YES: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P. 00-15).
NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

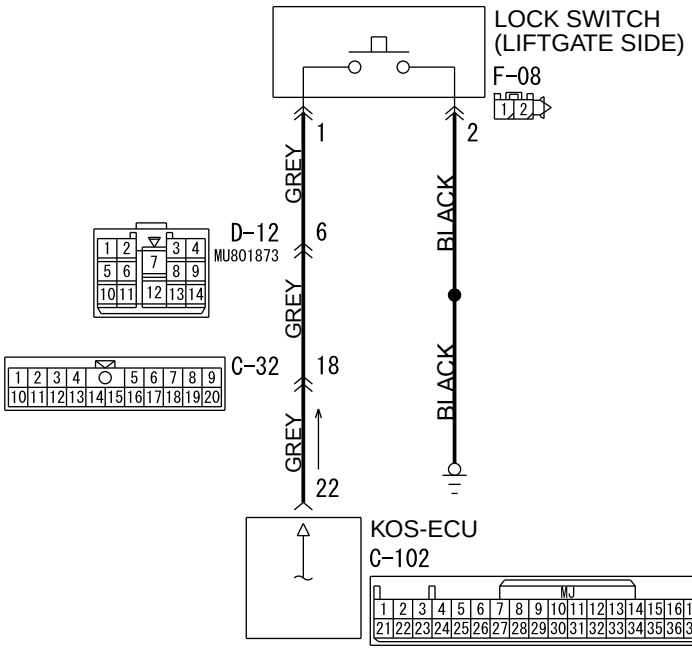
INSPECTION PROCEDURE 11: Lock Switch (Liftgate) does not Work.

M14209100075USA0000010000

⚠ CAUTION

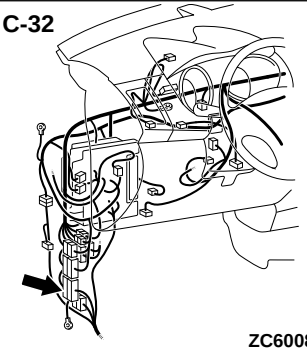
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Lock switch (Liftgate) Circuit



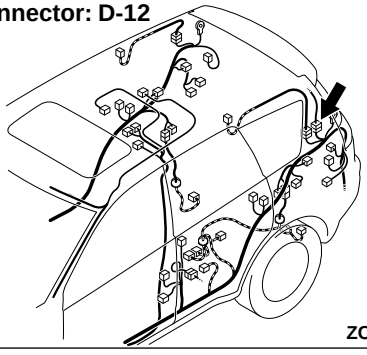
ZC6031320000

Connector: C-32



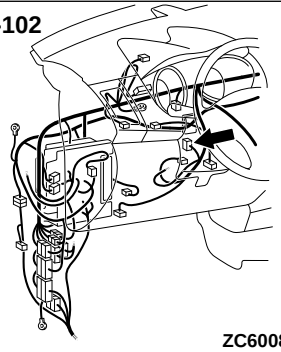
ZC6008750027

Connector: D-12



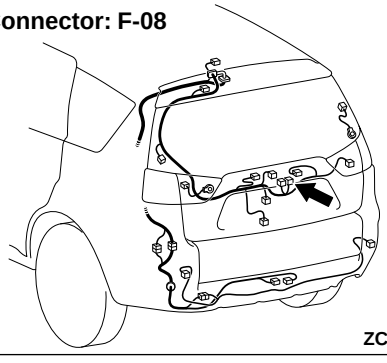
ZC6008800006

Connector: C-102



ZC6008750028

Connector: F-08



ZC6008820002

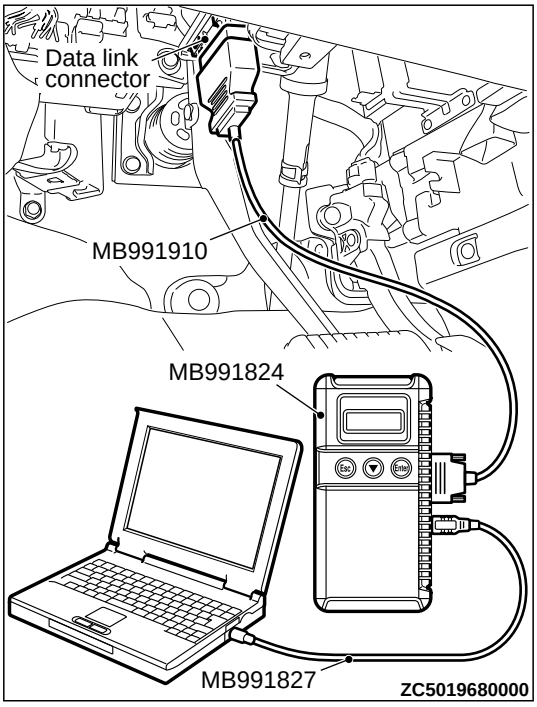
PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (liftgate)
- Malfunction of the lock switch (liftgate side)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

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



⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 and lock switch (liftgate side) connector F-08 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and lock switch (liftgate side) connector F-08 in good condition?
YES: Go to Step 3.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the lock switch (liftgate) works normally.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal No. 22) and lock switch (liftgate side) connector F-08 (terminal No. 1) and lock switch (liftgate side) connector F-08 (terminal No. 2) and ground.
NOTE: Also check intermediate connector C-32 and D-12 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-32 and D-12 is damaged, repair or replace the damaged component(s)

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

Q:Are the wiring harness between KOS-ECU connector C-102 (terminal No. 22) and lock switch (liftgate side) connector F-08 (terminal No. 1) and lock switch (liftgate side) connector F-08 (terminal No. 2) and ground in good condition?

YES: Go to Step 4.

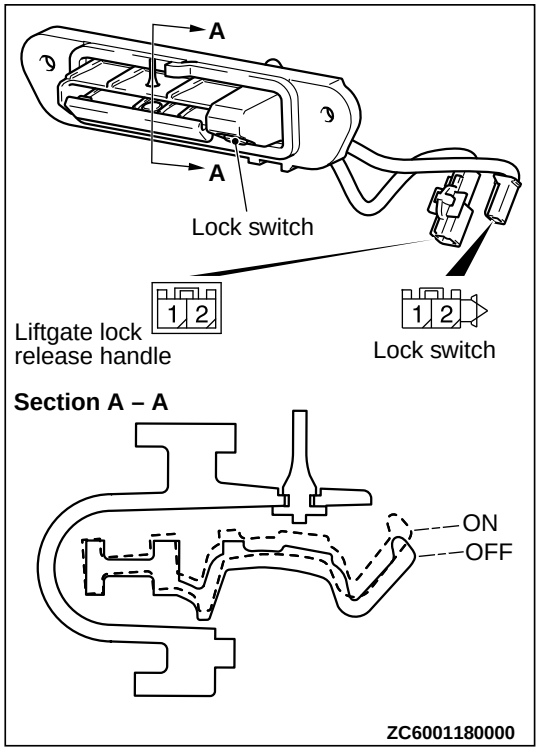
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the lock switch (liftgate) works normally.

STEP 4. Lock switch (liftgate side) check

(1) Remove the liftgate lock release handle (Refer to GROUP 42Ac, Liftgate Handle and Latch P.42Ac-10).

(2) Check continuity when the lock switch (liftgate side) is operated to "ON" or "OFF" position.

Switch position	Terminal number	Normal value
ON	1 - 2	Continuity exists (2 Ω or less)
OFF	1 - 2	Open circuit



Q:Is the lock switch (liftgate side) normal?

YES: Go to Step 5.

NO: Replace the liftgate lock release handle. Check that the lock switch (liftgate) works normally.

STEP 5. KOS communication test

Using scan tool (M.U.T-III), perform the antenna communication test to check that the exterior transmitter antenna (liftgate side) is normal (Refer to P.42B-169).

Q:Is the check result normal?

YES: Go to Step 6.

NO: Perform troubleshooting for the diagnostic trouble code No. B240C (Refer to P.42B-18).

STEP 6. Check of the troubles

Operate the lock switch (liftgate side) to check that the door can be locked.

Q:Is the check result normal?

YES: Intermittent malfunction is suspected. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P. 00-15).
NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

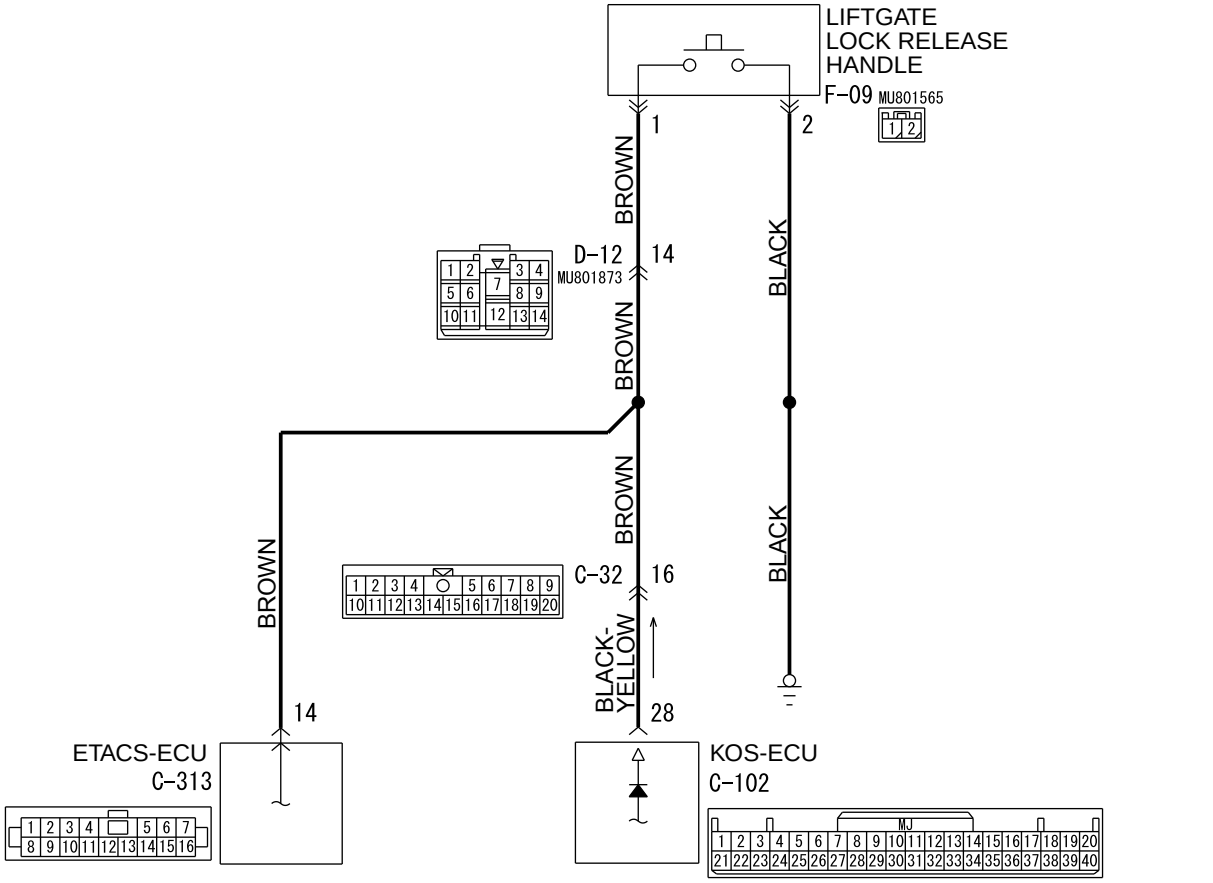
INSPECTION PROCEDURE 12: Liftgate Lock Release Handle does not Work.

M14209100114USA0000010000

⚠ CAUTION

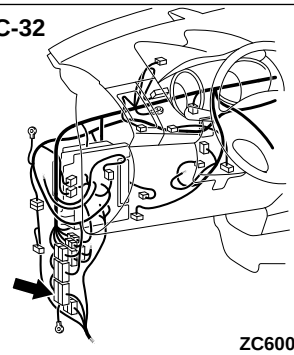
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

Liftgate Lock Release Handle Circuit



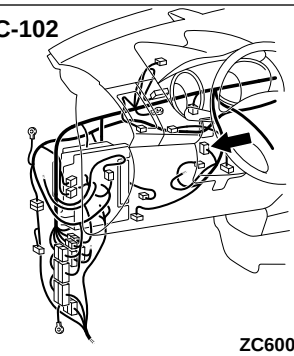
ZC6031330000

Connector: C-32



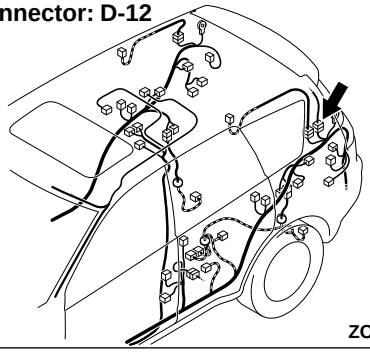
ZC6008750027

Connector: C-102



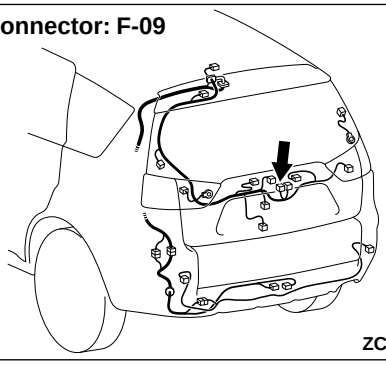
ZC6008750028

Connector: D-12



ZC6008800006

Connector: F-09



ZC6008820003

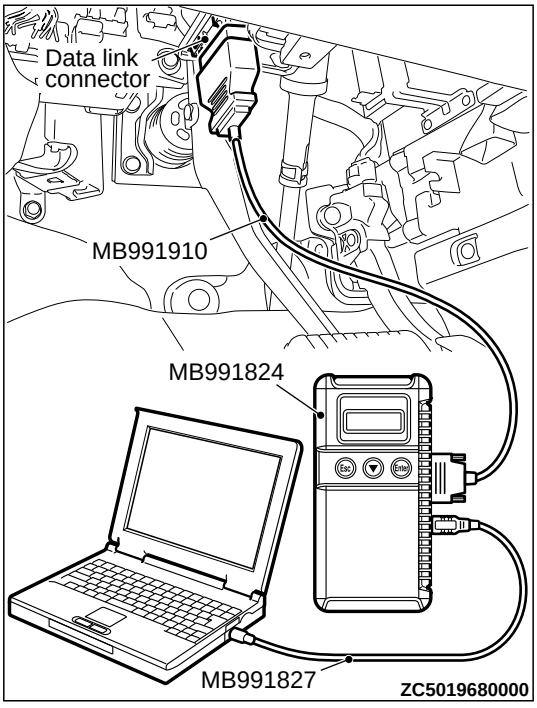
PROBABLE CAUSES

- Malfunction of the exterior transmitter antenna assembly (liftgate)
- Malfunction of the liftgate lock release handle
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Check KOS-ECU connector C-102 and liftgate lock release handle connector F-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and liftgate lock release handle connector F-09 in good condition?

YES: Go to Step 3.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the liftgate lock release handle works normally.

STEP 3. Check the wiring harness between KOS-ECU connector C-102 (terminal No. 28) and liftgate lock release handle connector F-09 (terminal No. 1) and lock switch (liftgate side) connector F-08 (terminal No. 2) and ground.

NOTE: Also check intermediate connector C-32 and D-12 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-32 and D-12 is damaged, repair or replace the damaged component(s) as described in GROUP 00E, Harness Connector Inspection P.00E-2.

Q:Are the wiring harness between KOS-ECU connector C-102 (terminal No. 28) and liftgate lock release handle connector F-09 (terminal No. 1) and lock switch (liftgate side) connector F-08 (terminal No. 2) and ground in good condition?

YES: Go to Step 4.
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or

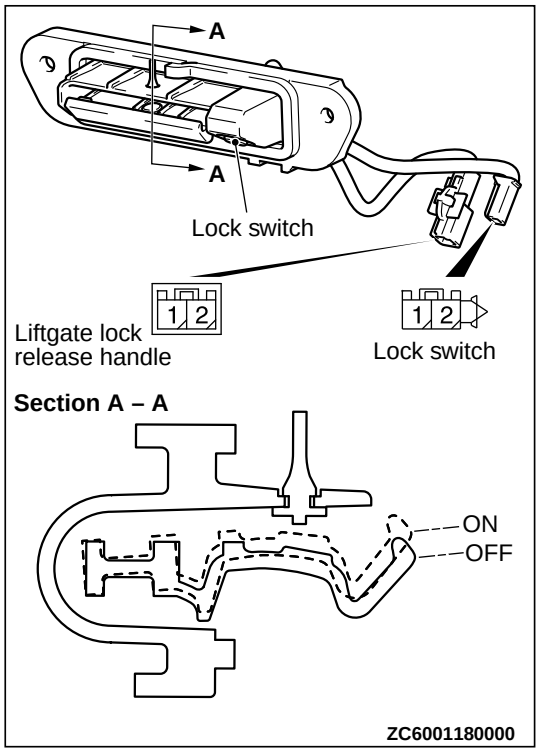
terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the liftgate lock release handle works normally.

STEP 4. Liftgate lock release handle check

(1) Remove the liftgate lock release handle (Refer to GROUP 42Ac, Liftgate Handle and Latch P.42Ac-10).

(2) Check continuity when the liftgate lock release handle is operated to "ON" or "OFF" position.

Switch position	Terminal number	Normal value
ON	1 - 2	Continuity exists (2 Ω or less)
OFF	1 - 2	Open circuit



Q:Is the liftgate lock release handle normal?

YES: Go to Step 5.

NO: Replace the liftgate lock release handle. Check that the liftgate lock release handle works normally.

STEP 5. KOS communication test

Using scan tool (M.U.T-III), perform the antenna communication test to check that the exterior transmitter antenna (liftgate side) is normal (Refer to P.42B-169).

Q:Is the check result normal?

YES: Go to Step 6.

NO: Perform troubleshooting for the diagnostic trouble code No. B240C (Refer to P.42B-18).

STEP 6. Check of the troubles

Operate the liftgate lock release handle to check that the door can be locked.

Q:Is the check result normal?

YES: Intermittent malfunction is suspected. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P.00-15).

NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

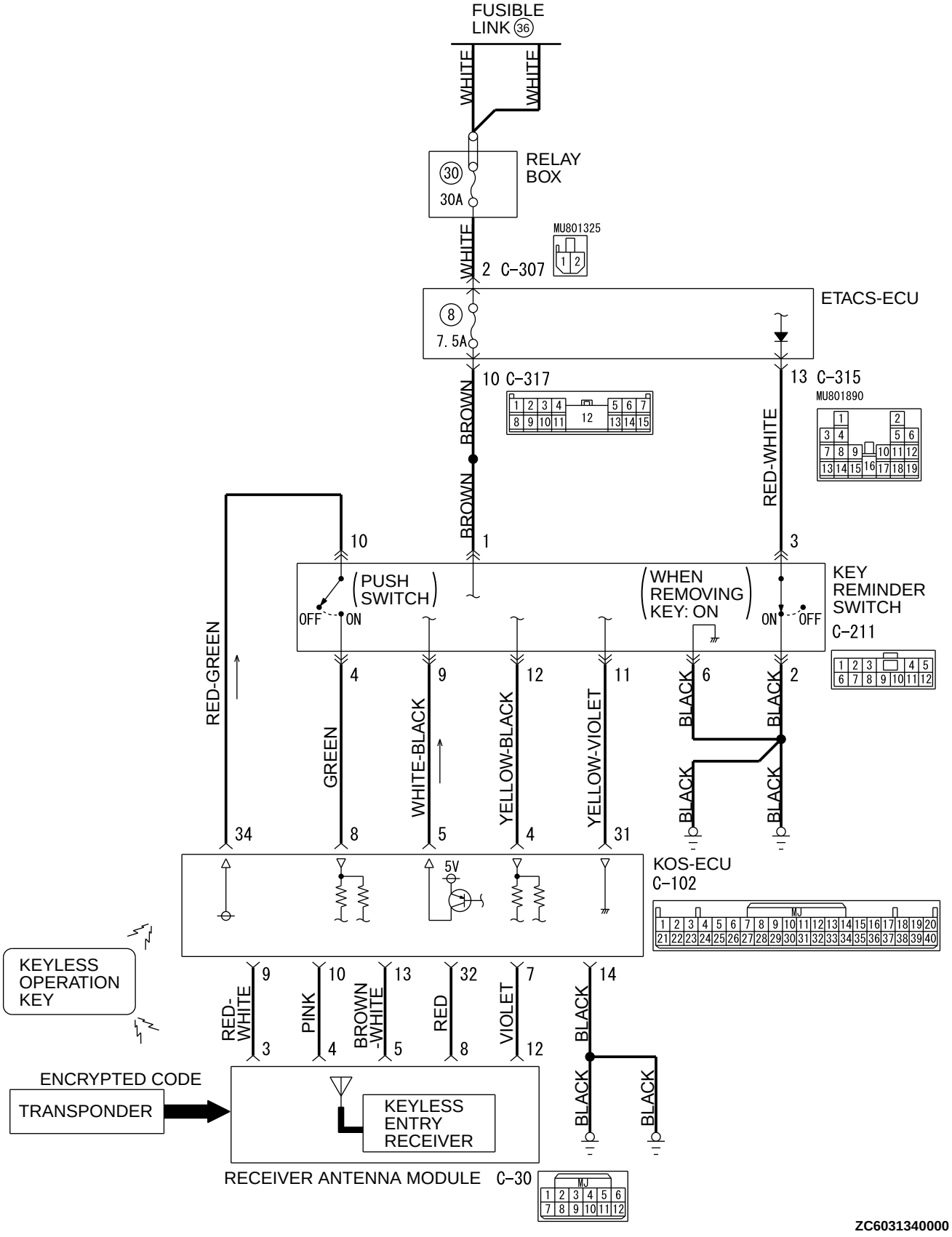
INSPECTION PROCEDURE 13: KEYLESS ENTRY SYSTEM DOES NOT WORK.

M14209100079USA0000010000

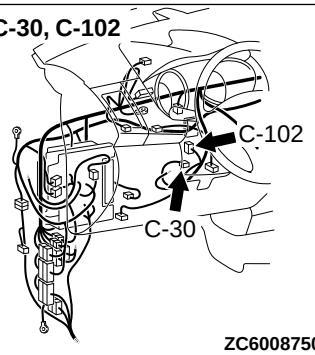
⚠ CAUTION

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

KOS-ECU System Circuit

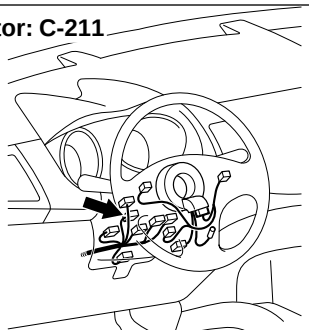


Connectors: C-30, C-102



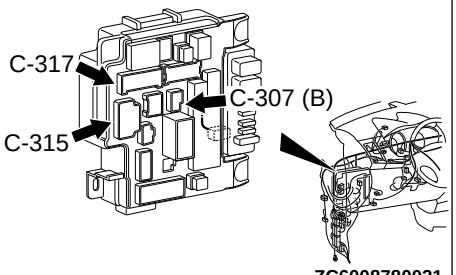
ZC6008750029

Connector: C-211



ZC6008770002

Connectors: C-307, C-315, 317



ZC6008780021

OPERATION

The receiver antenna module receives lock and unlock signals from the keyless operation key, and sends them to KOS-ECU, and further to ETACS-ECU. Also, when ETACS receives signals from the key reminder switch and all the door switches, ETACS-ECU judges them to activate the keyless entry system.

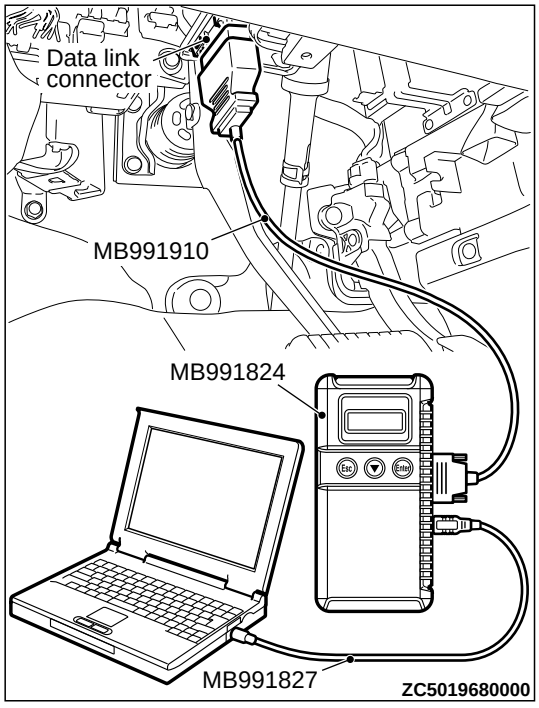
PROBABLE CAUSES

- Malfunction of CAN bus line
- Malfunction of the door switches
- Malfunction of the key reminder switch
- Malfunction of the receiver antenna module
- Malfunction of the keyless operation key
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU
- Malfunction of ETACS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



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

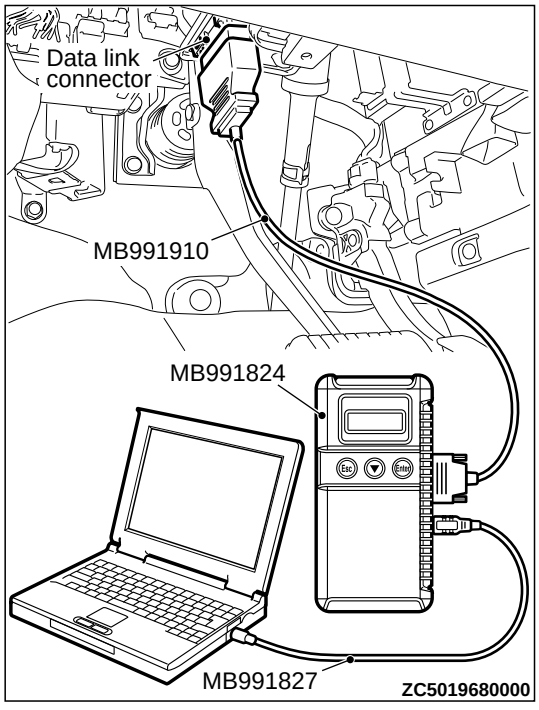
⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the CAN bus lines related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Repair the CAN bus line (Refer to GROUP 54D, CAN bus diagnostics table P.54D-17).
NO: Go to Step 2.



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

⚠ CAUTION

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

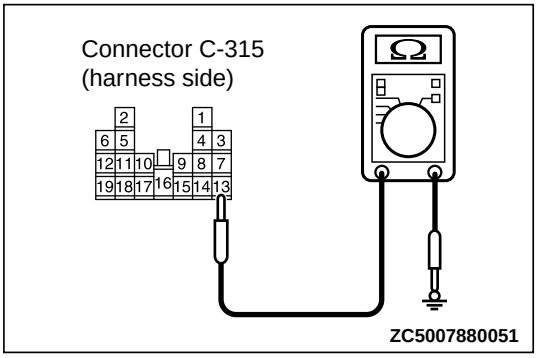
(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 3.

STEP 3. Key reminder switch check

(1) Disconnect the C-315 ETACS-ECU connector.
(2) Measure the resistance at the harness-side connector with the ignition key removed from the ignition key cylinder.

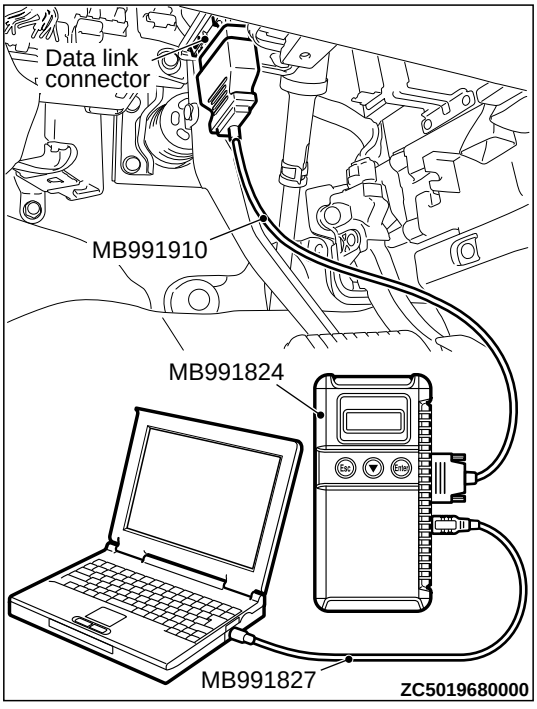


(3) Check for continuity between the C-315 ETACS-ECU connector terminal No. 13 and the ground.
OK: Continuity exists (2 Ω or less)

Q:Is the check result normal?
YES: Go to Step 4.
NO: Check the C-211 key reminder switch connector, the C-315 ETACS-ECU connector, the wiring harness between the C-211 key reminder switch connector (terminal No. 3) and the C-315 ETACS-ECU connector (terminal No. 13), and between the C-211 key reminder switch connector (terminal No. 2) and the ground. If they are normal, replace the key reminder switch.

STEP 4. Using scan tool MB991958, check data list.
Check the signals related to the keyless entry system operation.

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



(1) Connect scan tool MB991958. Refer to "How to connect the Scan Tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check the ETACS data list.
- Turn the ignition switch to the LOCK (OFF) position.
- Close the driver's door.
- Close the passenger's door.
- Close the RH-side rear door.
- Close the LH-side rear door.
- Close the liftgate.
- Remove the ignition key from the ignition key cylinder.

Item No.	Item name	Normal condition
Item 254	IG voltage	Battery voltage
Item 256	Dr door ajar switch	Close
Item 257	As door ajar switch	Close
Item 258	RR door ajar switch	Close
Item 259	RL door ajar switch	Close
Item 260	Trunk/gate trunk ajar switch	Close
Item 264	Handle lock switch	Key in → Key out

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

Q:Is the check result normal?
YES (Normal conditions are displayed for all the items.): Go to Step 5.

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

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

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

NO (Normal condition is not displayed for item No. 258.): Refer to GROUP 54Ad, Inspection Procedure 8: ETACS-ECU does not receive any signal from the rear door switch (RH) P.54Ad-80.

NO (Normal condition is not displayed for item No. 259.): Refer to GROUP 54Ad, Inspection Procedure 7: ETACS-ECU does not receive any signal from the rear door switch (LH) P.54Ad-77.

NO (Normal condition is not displayed for item No. 260.): Refer to GROUP 54Ad, Inspection Procedure 9: ETACS-ECU does not receive any signal from the liftgate switch P.54Ad-82.

NO (Normal condition is not displayed for item No. 264.): Refer to GROUP 54Ad, Inspection Procedure 3: ETACS-ECU does not receive any signal from the key reminder switch. P.54Ad-64.

STEP 5. Check KOS-ECU connector C-102 and receiver antenna module connector C-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and receiver antenna module connector C-30 in good condition?

YES: Go to Step 6.

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

STEP 6. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 7, 9, 10 and 32) and receiver antenna module connector C-30 (terminal Nos. 12, 3, 4 and 8).

Q:Is the wiring harness between KOS-ECU connector C-102 (terminal Nos. 7, 9, 10 and 32) and receiver antenna module connector C-30 (terminal Nos. 12, 3, 4 and 8) in good condition?

YES: Go to Step 7.

NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring

harness as necessary. Check that the driver's door unlock sensor works normally.

STEP 7. Check with another registered keyless operation key.

Check that the keyless entry function can be used with another keyless operation key.

Q:Can the keyless entry function be used?

YES: Replace the keyless operation key concerned and register the ID codes (Refer to P.42B-163).

NO: Go to Step 8.

STEP 8. Check of the troubles

Replace ETACS-ECU. After the replacement, perform the coding, and check that the keyless entry system operates normally.

Q:Is the check result normal?

YES: Intermittent malfunction is suspected (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).

NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

INSPECTION PROCEDURE 14: KOS Timer Lock Function does not Work.

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⚠ CAUTION

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

OPERATION

After the door is unlocked with the keyless entry function, if no operation is performed, the door is locked when the time specified by a customization function has elapsed. However, an open signal from any door, key reminder switch OFF (with the key inserted) signal, or ignition push switch ON signal has been input to ETACS, the KOS timer will not operate.

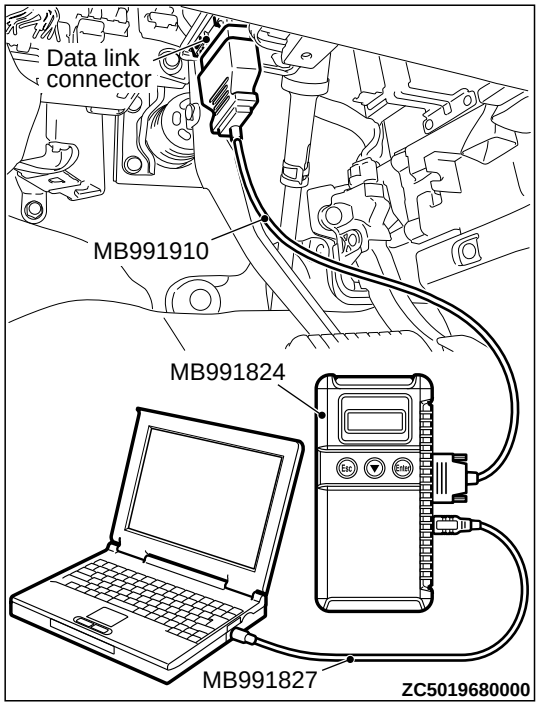
PROBABLE CAUSES

- Malfunction of ETACS-ECU
- Malfunction of the door switches

DIAGNOSTIC PROCEDURE

Required Special Tools:

- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

STEP 2. Retest the system.

Check that the KOS timer lock function operates.

Q:Is the check result normal?

YES: Intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15).
NO: Perform troubleshooting for each door switch (Refer to GROUP 54Ad, P.54Ad-60Input signal chart).

INSPECTION PROCEDURE 15: The Dome Light, The Turn-signal Lights and The Horn do not Operate through The Answerback Function.

M14209100080USA0000010000

⚠ CAUTION

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

OPERATION

When the keyless entry function is used, the keyless entry hazard answerback function, dome light or horn answerback function operate as set by ETACS customization function. (If the flashing count is set to 0 with a customization function, no answerback function is performed.)

PROBABLE CAUSES

- Function setting error or no setting with a customization
- Malfunction of the turn signal light
- Malfunction of the dome light
- Malfunction of the horn
- Malfunction of ETACS-ECU

DIAGNOSTIC PROCEDURE

Required Special Tools:
- MB991223: Harness Set
- MB992006: Extra Fine Probe
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Verify the hazard warning lights.
Check that the hazard warning lights illuminate normally.

Q:Is the check result normal?
YES: Go to Step 2.
NO: Refer to GROUP 54Ac, Inspection Procedure 1: The Hazard Warning lights does not Illuminate P.54Ac-163.

STEP 2. Verify the dome light.
Check that the dome light illuminate normally.

Q:Is the check result normal?
YES: Go to Step 3.
NO: Refer to GROUP 54Ac, Trouble Symptom Chart P. 54Ac-140.

STEP 3. Verify the horn.
Check that the horn normally.

Q:Is the check result normal?
YES: Go to Step 4.
NO: Replace the horn (Refer to GROUP 54Af, Horn P. 54Af-28).

STEP 4. Check the customize function.
Check that any one of the followings other than "Lock: 0, Unlock: 0" is set for "Hazard answerback" with a customization function.
- Lock:1, Unlock:2
- Lock:1, Unlock:0
- Lock:0, Unlock:2
- Lock:2, Unlock:1
- Lock:2, Unlock:0
- Lock:0, Unlock:1

Q:Is the check result normal?
YES: Go to Step 5.
NO: Set "Hazard answerback" to any one other than "Lock: 0, Unlock: 0" with a customization function (Refer to P. 42B-170).

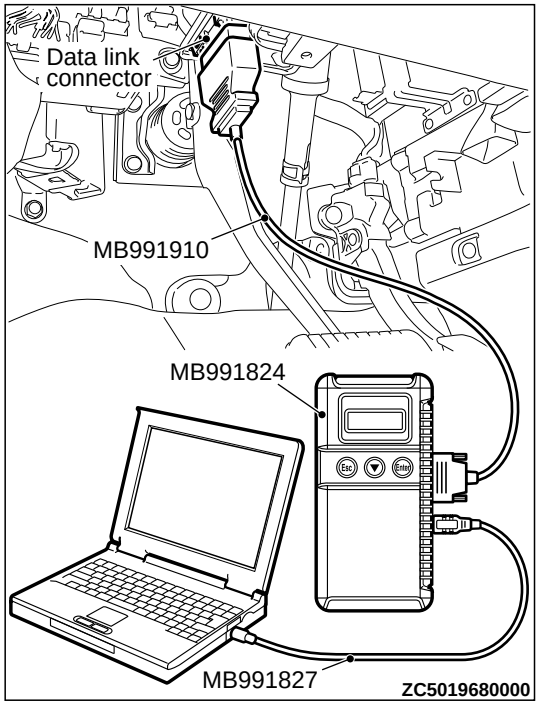
STEP 5. Check the customize function.
Check that any one of the followings other than "Not sound horn" is set for "Horn chirp by RKE" with a customization function.
- Lock any time
- W lock any time

Q:Is the check result normal?
YES: Go to Step 6.
NO: Set "Horn chirp by RKE" to any one other than "Not sound horn" with a customization function (Refer to P. 42C-91).

STEP 6. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

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



(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 7.

STEP 7. Check of the troubles
Check if the keyless entry hazard answerback, doom light answerback and horn answerback function works normally.

Q:Is the check result normal?
YES: Intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction P.00-15.)
NO: Replace ETACS-ECU.

INSPECTION PROCEDURE 16: Outer Tone alarm does not Sound.

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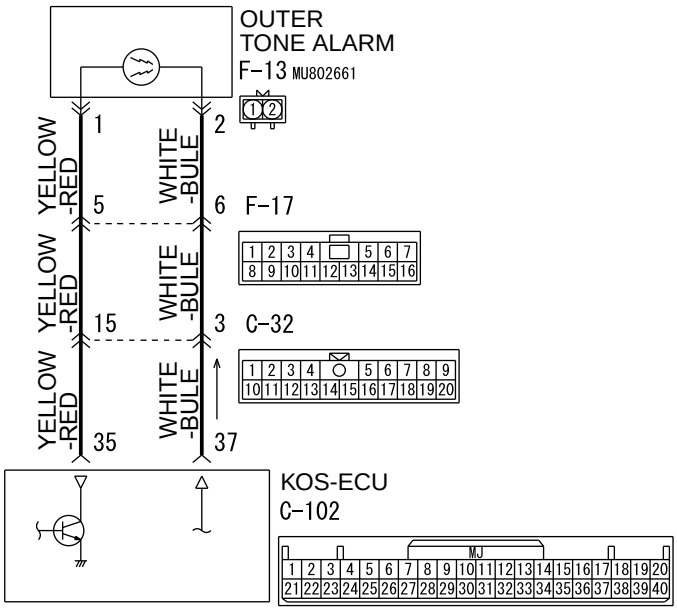
⚠ CAUTION

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

Outer Tone Alarm Circuit



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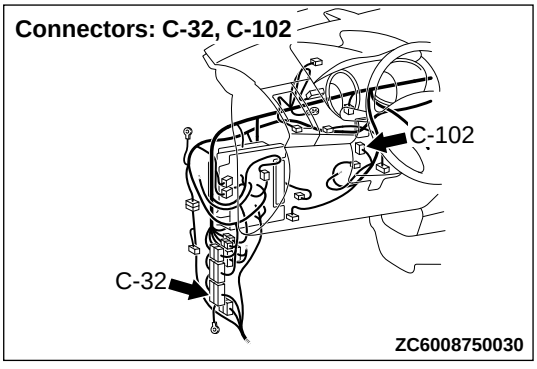
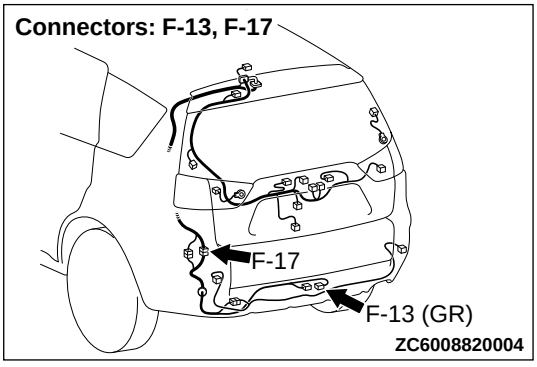




OPERATION

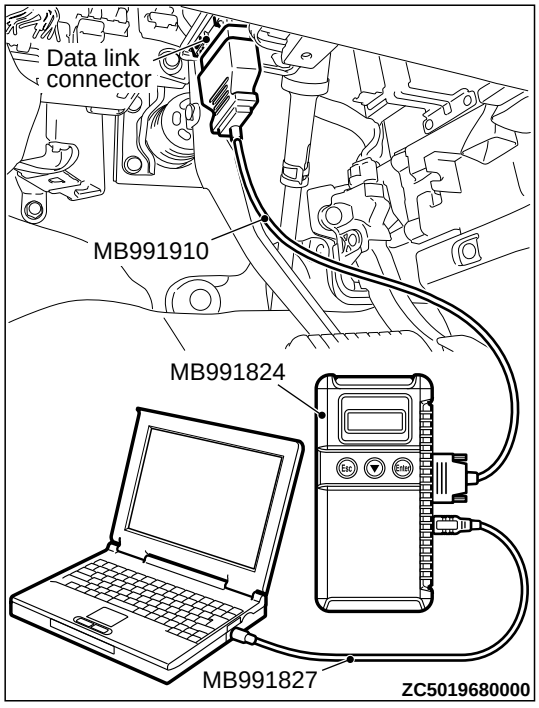
The outer tone alarm sounds under the following conditions.

- When the door is locked or unlocked with the keyless or keyless operation function
- Door lock does not operate.
- The keyless operation key is brought out of the vehicle.
- Also, with a customization function, "Tone alarm answerback" may be set to "Not Sound Tone alarm."

PROBABLE CAUSES

- Malfunction of the antenna and outer tone alarm assembly
- Malfunction of the KOS-ECU
- Malfunction of the connector
- Function setting error or no setting with a customization

DIAGNOSTIC PROCEDURE



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

⚠ CAUTION

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

(1) Connect scan tool MB991958. Refer to "How to connect scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check whether the KOS-ECU related DTC is set.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?

YES: Diagnose the KOS-ECU. Refer to P.42B-18.
NO: Go to Step 2.

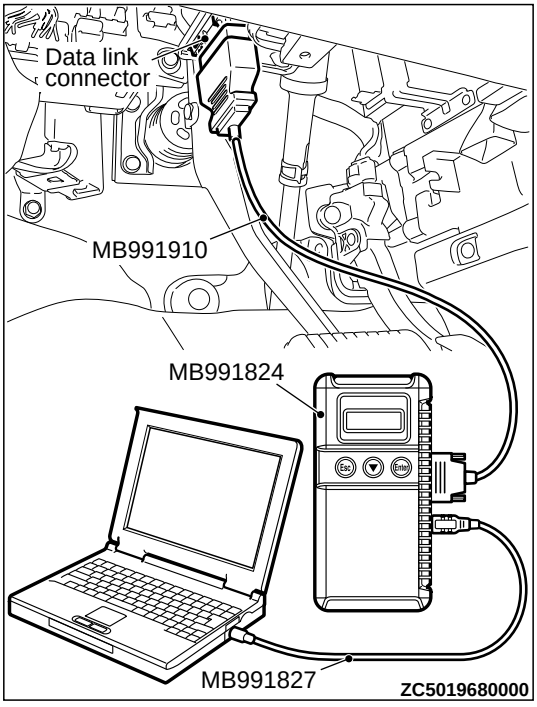
STEP 2. Check the customize function.

Check that either of the followings other than "Not sound tone alarm" is set for "Tone alarm answer back" with the customization function.

- At keyless key
- At keyless
- At Both

Q:Is the check result normal?

YES: Go to Step 3.
NO: Set either of the followings other than "Not sound tone alarm" for "Tone alarm answer back" with the customization function (Refer to P.42B-170).



STEP 3. Using scan tool MB991958, read the actuator test.

⚠ 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 scan tool (M.U.T.-III) P.42B-10."
(2) Turn the ignition switch to the "ON" position.
(3) Check that the outer tone alarm sounds (Refer to P. 42B-158).
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q:Is the DTC set?
YES: Go to Step 7.
NO: Go to Step 4.

STEP 4. Check KOS-ECU connector C-102 and outer tone alarm connector F-13 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Are KOS-ECU connector C-102 and outer tone alarm connector F-13 in good condition?
YES: Go to Step 5.
NO: Repair or replace the damaged component(s). Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Check that the outer tone alarm works normally.

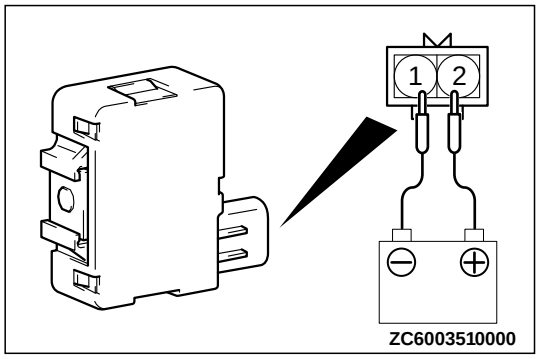
STEP 5. Check the wiring harness between KOS-ECU connector C-102 (terminal Nos. 35 and 37) and outer tone alarm connector F-13 (terminal Nos. 1 and 2).

NOTE: Also check intermediate connector C-32 and F-17 for loose, corroded, or damaged terminals, or terminals pushed back in the connector. If intermediate connector C-32 and F-17 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 KOS-ECU connector C-102 (terminal Nos. 35 and 37) and outer tone alarm connector F-13 (terminal Nos. 1 and 2) in good condition?
YES: Go to Step 6.
NO: The wiring harness may be damaged or the connector (s) may have loose, corroded or damaged terminals, or terminals pushed back in the connector. Repair the wiring harness as necessary. Check that the outer tone alarm works normally.

STEP 6. Outer tone alarm check

(1) Remove the outer tone alarm (Refer to P.42B-176).



(2) Check that the outer tone alarm sounds once when the terminals are connected to the battery as shown.

Q:Is the outer tone alarm normal?
YES: Go to Step 7.
NO: Replace the outer tone alarm. Check that the outer tone alarm works normally.

STEP 7. Check of the troubles
Check that the outer tone alarm sounds when the outer tone alarm sounding conditions are met.

Q:Is the check result normal?
YES: Intermittent malfunction is suspected. (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points - How to cope with intermittent malfunctions P. 00-15).
NO: Replace KOS-ECU and register the ID codes (Refer to P.42B-163).

DATA LIST REFERENCE TABLE

M14209100050USA0000010000

Item No.	Check items	Check conditions	Normal conditions
01*	Received key data(ID)	-	Memorised keyless operation key ID
02	Received key data (button)	-	Switch display of the keyless operation key
03	Front door SW(RH) lock	Driver's door lock switch: ON	ON
		Driver's door lock switch: OFF	OFF
04	Front door SW(RH) unlock	Driver's door unlock switch: ON	ON
		Driver's door unlock switch: OFF	OFF
05	Front door SW(LH) lock	Front passenger's door lock switch: ON	ON
		Front passenger's door lock switch: OFF	OFF
06	Front door SW(LH) unlock	Front passenger's door unlock switch: ON	ON
		Front passenger's door unlock switch: OFF	OFF
07	Tail gate SW lock	Liftgate lock switch: ON	ON
		Liftgate lock switch: OFF	OFF
08	Tail gate SW unlock	Liftgate unlock switch: ON	ON
		Liftgate unlock switch: OFF	OFF
13	Number of registered IMMOB.key	-	Number of the emergency keys memorised

Item No.	Check items	Check conditions	Normal conditions
14	Memorized KOS keys	-	Number of the keyless operation keys memorised
21	Air pressure, Tire 1	-	-
22	Air pressure, Tire 2		
23	Air pressure, Tire 3		
24	Air pressure, Tire 4		
25	Air pressure, Tire 5		
31	Acceleration, Tire 1	-	-
32	Acceleration, Tire 2		
33	Acceleration, Tire 3		
34	Acceleration, Tire 4		
35	Acceleration, Tire 5		
36	Threshold of PRS. warning	The tire pressure is within the specified value range.	OFF
		The tire pressure is not within the specified value range.	ON
37	Threshold of PRS. warning release	The tire pressure is within the specified value range.	ON
		The tire pressure is not within the specified value range.	OFF
38	Number of registered TPMS ID	-	Number of stored TPMS
39	Ignition signal(CAN data)	Ignition switch status information received from ETACS-ECU via CAN:ON	ON
		Ignition switch status information received from ETACS-ECU via CAN:OFF	OFF
40	Ignition signal(Port input)	Ignition switch: ON	ON
		Ignition switch: OFF	OFF
41	VSS	Drive the vehicle	The scan tool and the tachometer readings are approximately the same

*NOTE: *shows that it is displayed but not used.*

ACTUATOR TEST TABLE

M14209100051USA0000010000

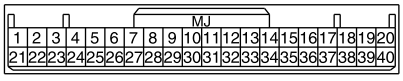
Item No.	Check items	Driven component
01	Outer tone alarm	Forces to sound the outer tone alarm.

TERMINAL VOLTAGE REFERENCE CHART

M14209100068USA0000010000

KOS-ECU TERMINAL CHECK

C-102



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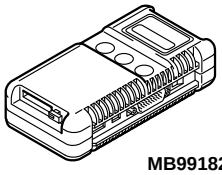
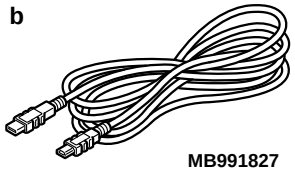
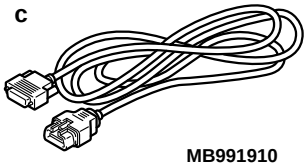
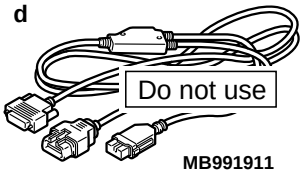
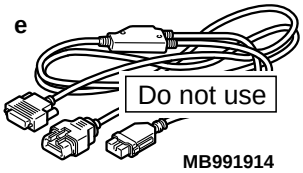
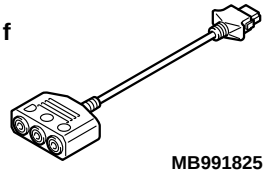
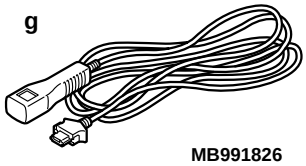
Terminal number	Check items	Check conditions	Normal conditions
1	CAN H	-	-
2	CAN L	-	-
3	-	-	-
4	Steering handle unit signal output	When the ignition switch is operated	0 to 5 V (pulse signal)
5	Steering handle unit power supply	Always	5 V
6	Interior transmitter antenna assembly (front and rear) and exterior transmitter antenna assembly (driver's side, front passenger's side, and liftgate) ground	Always	0 V
7	Receiver antenna module power supply	Always	5 V
8	Push switch inside the steering handle lock	Push switch inside the steering handle lock: ON	12 V
9	Receiver antenna module (door entry) signal output	Keyless operation key lock switch and unlock switch: ON	0 to 5 V (pulse signal)
10	Receiver antenna module (door entry) RSSI output	-	-
11	Receiver antenna module (immobilizer) signal output	When communicating with the emergency key (ignition switch: ON)	0 to 5 V (pulse signal)
12	Receiver antenna module (immobilizer) CLOCK output	When communicating with the emergency key (ignition switch: ON)	0 to 5 V (pulse signal)
13	Receiver antenna module (door entry) power control	Always	0 to 5 V (pulse signal)
14	Ground	Always	0 V
15	Interior transmitter antenna assembly (rear: passenger's side) signal output	When the keyless operation key is located near the rear seat and third seat in the passenger compartment	0 to 5 V (pulse signal)
16	Interior transmitter antenna assembly (front) signal output	When the keyless operation key is located near the front seats in the passenger compartment	0 to 5 V (pulse signal)

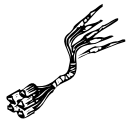
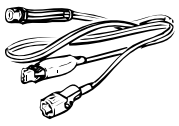
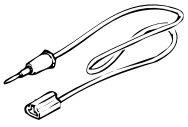
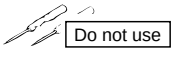
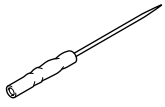
Terminal number	Check items	Check conditions	Normal conditions
17	Exterior transmitter antenna assembly (driver's side) signal output	When the keyless operation key is located near the driver's door outside the vehicle	0 to 8 V (pulse signal)
18	Exterior transmitter antenna assembly (front passenger's side) signal output	When the keyless operation key is located near the front passenger's door outside the vehicle	0 to 8 V (pulse signal)
19	Exterior transmitter antenna assembly (liftgate) signal output	When the keyless operation key is located near the liftgate outside the vehicle	0 to 8 V (pulse signal)
20	Interior transmitter antenna assembly (rear: driver's side) signal output	When the keyless operation key is located near the rear seat and third seat in the passenger compartment	0 to 5 V (pulse signal)
21	Lock switch (driver's side) output	Lock switch: ON	0 to 5 V (pulse signal)
22	Lock switch (liftgate) output	Lock switch: ON	0 to 5 V (pulse signal)
23	Lock switch (front passenger's side) output	Lock switch: ON	0 to 5 V (pulse signal)
24	Unlock sensor (driver's side) signal output	When the front door outside handle (driver's side) is grasped	0 to 5 V (pulse signal)
25	Unlock sensor (front passenger's side) signal output	When the front door outside handle (front passenger's side) is grasped	0 to 5 V (pulse signal)
26, 27	-	-	-
28	Liftgate lock release handle output	When the liftgate lock release handle is operated	0 to 5 V (pulse signal)
29, 30	-	-	-
31	Steering handle unit ground	Always	0 V
32	Receiver antenna module ground	Always	0 V
33	-	-	-
34	Push switch inside the steering handle lock power supply	Push switch inside the steering handle lock: ON	12V
35	Output to outer tone alarm (-)	Outer tone alarm is sounding	0 to 12 V (pulse signal)
36	Unlock sensor (driver's and front passenger's side) power supply	Always	10 V
37	Output to outer tone alarm (+)	Outer tone alarm is sounding	0 to 12 V (pulse signal)
38	Battery power supply	Always	Battery voltage
39	Power supply from ignition switch (IG1)	Ignition switch: ON	Battery voltage
40	Interior transmitter antenna assembly (front and rear) and exterior transmitter antenna assembly (driver's side, front passenger's side, and liftgate) power supply	Always	▪8 V (When transmitting to the exterior transmitter antenna)

Terminal number	Check items	Check conditions	Normal conditions
			▪5 V (When transmitting to the interior transmitter antenna)

SPECIAL TOOLS

M14209100043USA0000010000

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 YB9919580000	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Daimler Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.** ▪ Diagnostic trouble code, service data, actuator test check ▪ Registration of ID codes

Tool	Tool number and name	Supersession	Application
a  b  c  d  Do not use YB9912230000	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	Continuity check and voltage measurement at harness wire or connector for loose, corroded or damaged terminals, or terminals pushed back in the connector. a. Connector pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection
 MB992006	MB992006 Extra fine probe	-	Making voltage and resistance measurement during troubleshooting

ON-VEHICLE SERVICE

ID CODES REGISTRATION PROCEDURE

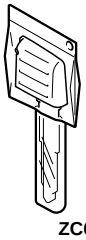
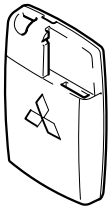
M14209100117USA0000010000

By operating the M.U.T.-III, the ID codes registration and antenna communication can be performed.

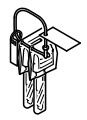
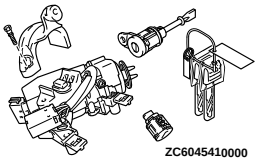
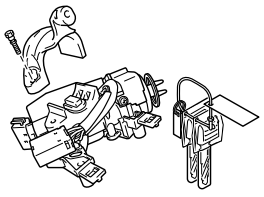
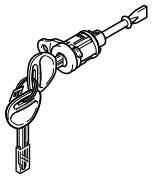
⚠ CAUTION

If registered, starting the engine by using the conventional key becomes impossible. The new key will not be able to start the engine, too, because it has a different key groove.

SUPPLY UNIT LIST FOR INDIVIDUAL KEY

Emaregency key	Keyless operation key	*NOTE: Blank key (It is the key that comes with the door service key set and the glove box service key set. It can only be used for locking and unlocking, and it cannot start the engine.)*
 ZC603741	 ZC6037420000	Blank key  ZC6044010001

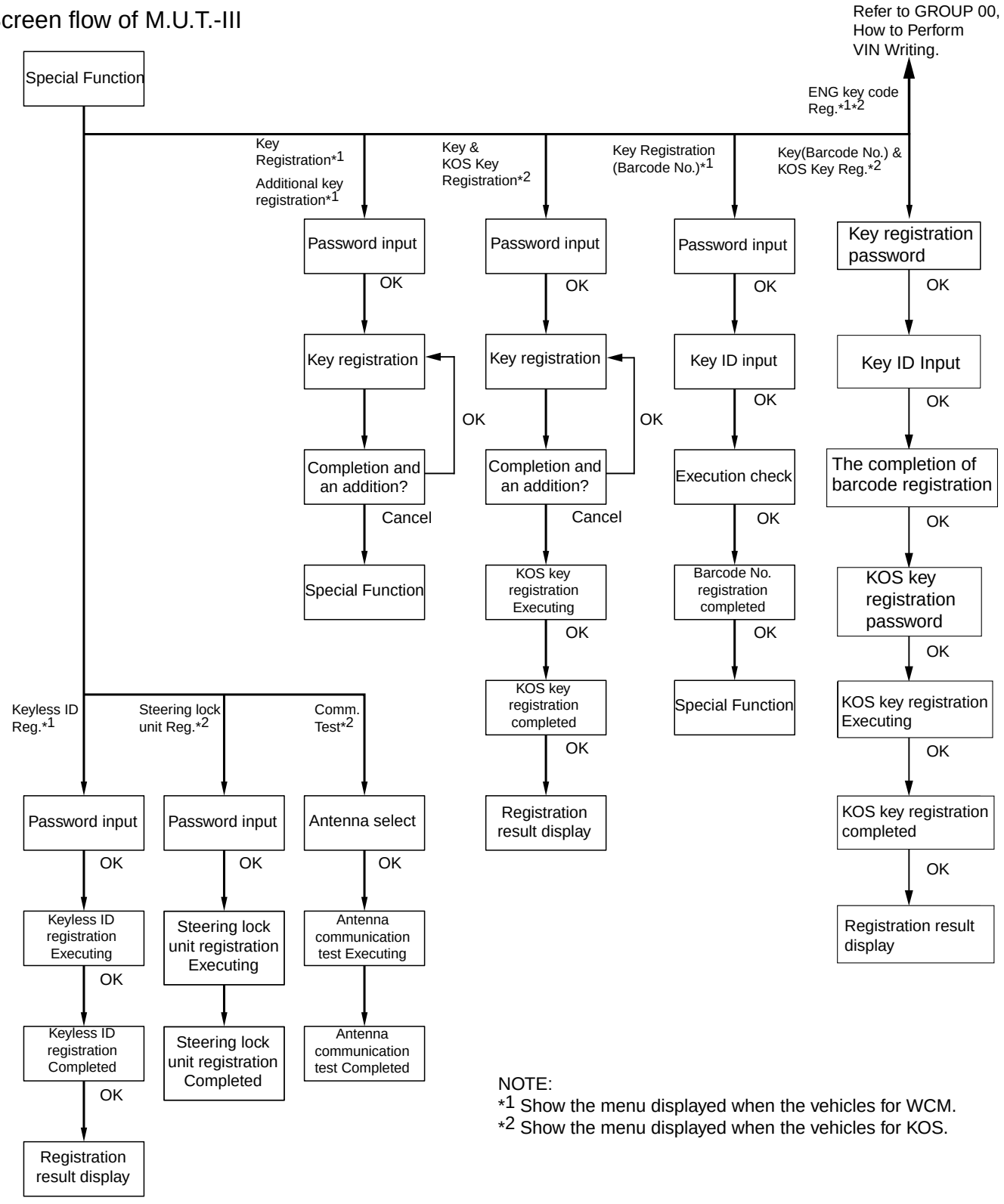
KEY SUPPLY UNIT LIST FOR OTHER THAN INDIVIDUAL KEY

Service key assembly	Full service key set	Handle lock service key set	Door service key set	Glove box service key set
 ZC6045520000	 ZC6045410000	 ZC6045510000	 ZC6045500000	 ZC6045390000

NOTE:

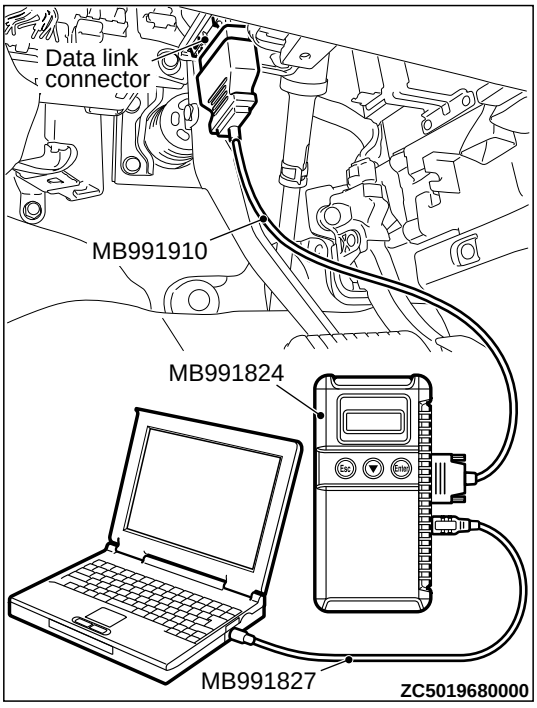
- *When re-registering the key (key ID), all the keys (key ID) registered before must be re-registered because all of them will be erased.*
- *When the key was replaced by the full service key set or when the key was replaced by the handle lock service key set separately, register the key (key ID) using the barcode No. attached to the key.*
- *After the key and keyless operation key is registered, start the engine with all the keys and keyless operation keys, and check that KOS operates normally.*

Screen flow of M.U.T.-III



NOTE:
*1 Show the menu displayed when the vehicles for WCM.
*2 Show the menu displayed when the vehicles for KOS.

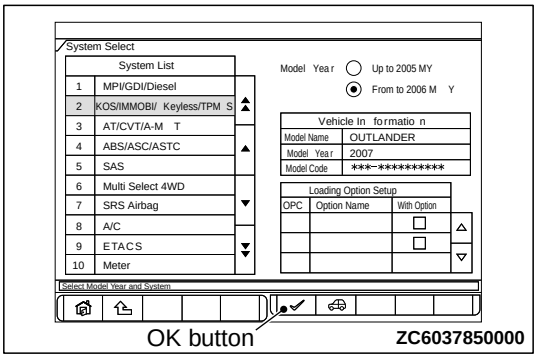
ZC6037540000



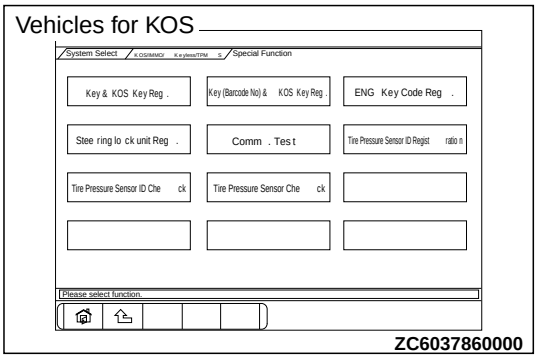
Connect the M.U.T.-III to the 16-pin data link connector as follows.

NOTE: For details on how to use the scan tool, refer to the "M.U.T.-III User's Manual."

1. Start the M.U.T.-III system on the PC and turn the ignition switch to the "ON" position.



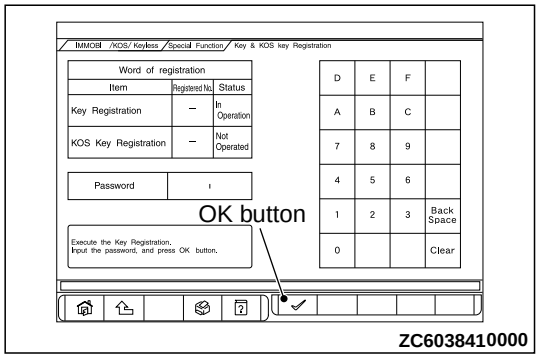
2. Select "KOS/IMMO//Keyless/TPMS" button from the "System Select" screen. Then, select the applicable option code item and push the OK button.
3. Select "Special Function" on the next screen.



4. Select the button of the operation to be performed from the "Special Function" screen.
   - "Key & KOS Key Reg.": When the keyless operation key or emergency key is replaced or added as a single unit, when the emergency key is replaced or added by a supply of service key assembly.
   - "Key(Barcode No.) & KOS Key Reg.": When the emergency key is replaced by the full service key set or the handle lock service key set is replaced by the piece.
   - "ENG key code Reg.": When the engine control module is replaced.
   - "Steering lock unit Reg.": When KOS-ECU is replaced but the steering lock assembly is not replaced.
   - "Comm. Test": When the KOS antenna communication status is checked.
   - "Tire Pressure Sensor ID Registration": When the TPMS transmitter is replaced.
   - "Tire Pressure Sensor Check": When the tire pressure sensor data is checked.
   - "Tire Pressure Sensor ID Check": When the tire pressure sensor ID is checked.

NOTE:
- *For "Key Code Registration," refer to GROUP 00 - Precautions before Service P.00-26.*
- *For "Tire Pressure Sensor ID Registration," refer to P.42B-172.*
- *For "Tire Pressure Sensor Check," refer to P. 42B-173.*
- *For "Tire Pressure Sensor ID Check," refer to P. 42B-174.*

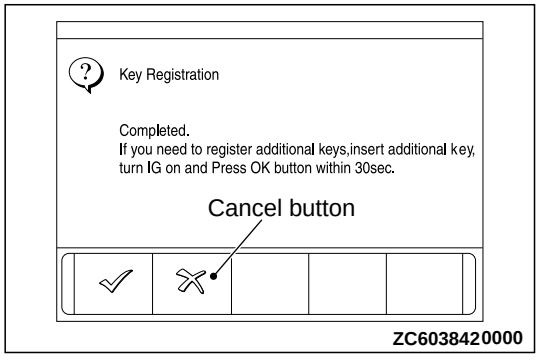
"KEY & KOS KEY REG." METHOD

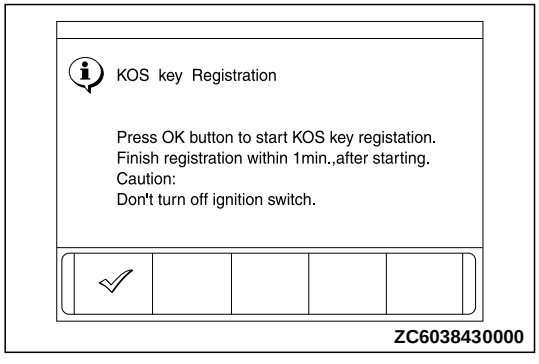


1. When "Key & KOS Key Registration" screen is displayed, enter the password for the key registration and press the OK button. Then, "Executing!" is displayed and the key registration process starts.

NOTE:

- *If the wrong password is entered consecutively 5 times, the password entry for the key registration will be disabled for 16 minutes.*
- *The key registration cannot be cancelled during the operation.*





2. When the key registration is completed, "Completed." is displayed. To continue the key registration, press the OK button according to the screen instructions. Then "Executing!" is displayed again and the next registration process starts. To finish the key registration and start the keyless operation key registration, press the cancel button. Then "Press OK button to start KOS key registration" is displayed.

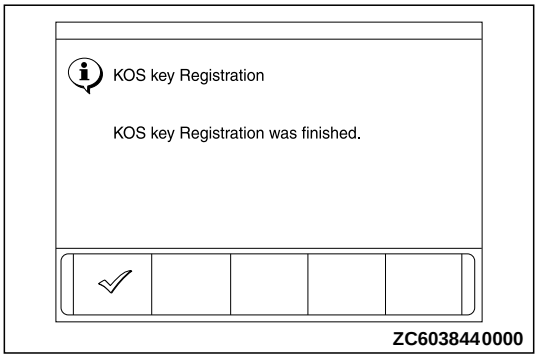
NOTE:

- *In order to register another key consecutively after registering the first key, the ignition switch must be turned to the ON position with the second key within 30 seconds after turning it to the "LOCK" (OFF) position with the first key.*
- *Up to eight keys can be registered.*

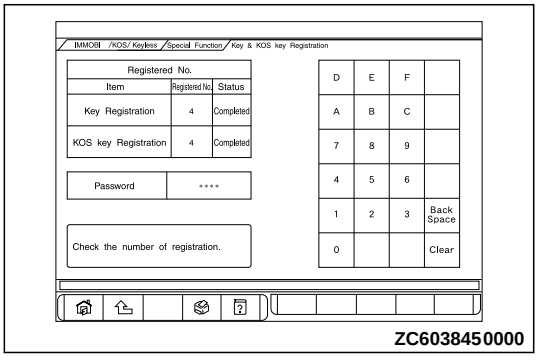
3. Press the lock switch of the keyless operation key to be registered twice within 1 minute to allow the keyless operation key to be registered. Complete the registration within 1 minute and press the OK button. Then the keyless operation key registration ends.

NOTE:

- *Up to 4 keyless operation keys can be registered.*
- *Register keyless operation keys inside the vehicle.*
- *Register the keyless operation keys with the key released from M.U.T.-III display.*

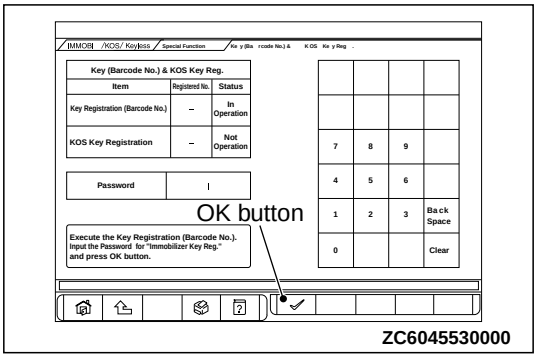


4. Push the OK button after "KOS key Registration was finished." is displayed.



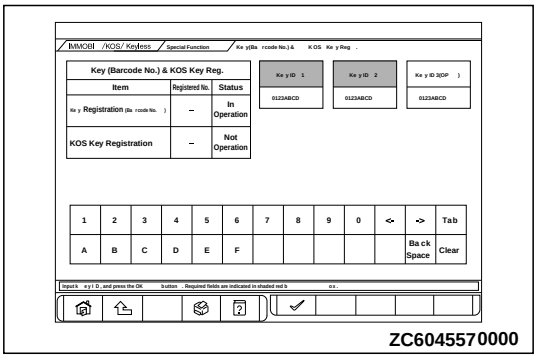
5. Check the number of the registered keys and keyless operation keys.

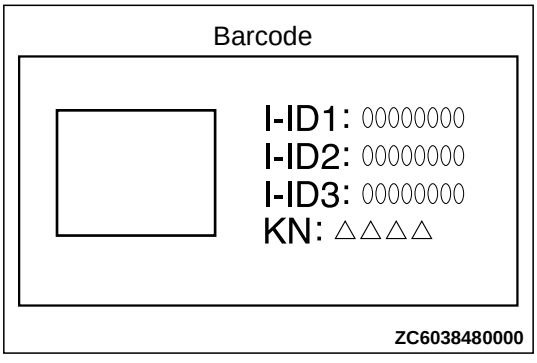
"KEY(BARCODE NO.) & KOS KEY REG." METHOD



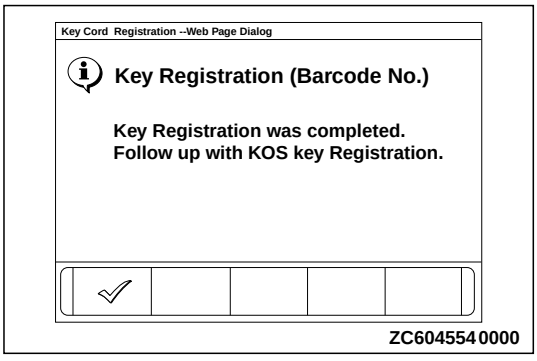
1. When "Key(Barcode No.) & KOS key Registration" screen is displayed, enter the password for the key registration and press the OK button.

NOTE: If the wrong password is entered consecutively 5 times, the password entry for the key registration will be disabled for 16 minutes.

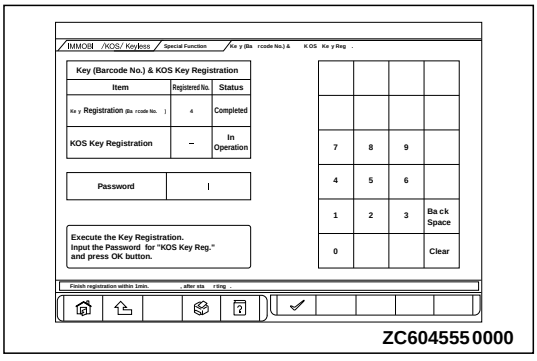




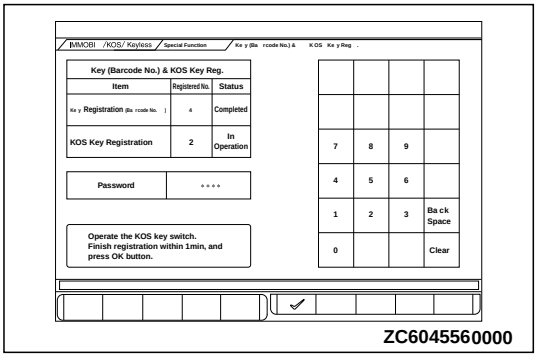
2. Follow the message on the screen and enter the Barcode No. Then, press the OK button.



3. "Key Registration was completed. Follow up with KOS key Registration. " is displayed, press the OK button and go to the keyless operation key registration.



4. Enter the password for keyless operation key registration and press the OK button. Then the keyless operation key registration starts.



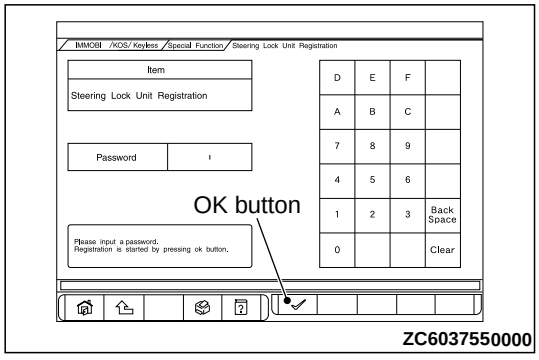
5. Press the lock switch of the keyless operation key to be registered twice within 1 minute to allow the keyless operation key to be registered. Complete the registration within 1 minute and press the OK button. Then the keyless operation key registration ends.

NOTE:

- *Up to 4 keyless operation keys can be registered.*
- *Register keyless operation keys inside the vehicle.*
- *Register the keyless operation keys with the key released from M.U.T.-III display.*

6. Push the OK button after "KOS key Registration was finished." is displayed.

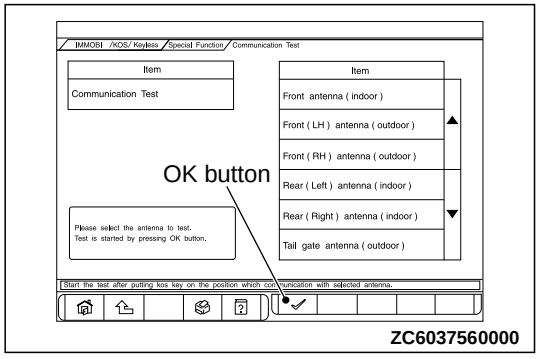
"STEERING LOCK UNIT REG." METHOD



7. Check the number of the registered keys and keyless operation keys.

1. Enter the password on "Steering Lock Unit Registration" screen and press the OK button to register the KOS ID.
2. Push the OK button after "Completed." is displayed.

"COMM. TEST" METHOD



1. Select the antenna to be tested on "Communication Test" screen, and press the OK button with the keyless operation key placed within the communication operational area.
2. Push the OK button after "Communication is normal." is displayed.

ANTENNA COMMUNICATION TEST

M14209100064USA0000010000

Refer to Procedure to register each ID code P.42B-163.

KEYLESS ENTRY SYSTEM CHECK

M14209100118USA0000010000

Check the keyless entry system function as described below. If it does not work, perform troubleshooting. Refer to P.42B-108.

- Operate the keyless operation key to check that the doors and liftgate can be locked and unlocked.
- Operate the keyless operation key to check that the answerback function works in response to door and liftgate locking/unlocking.

NOTE: The hazard and horn answerback setting can be changed using the customization function. Confirm which setting is activated before performing these checks. Refer to P.42B-170.

INSPECTION OF KEYLESS ENTRY TIMER LOCK FUNCTION

M14209100122USA0000010000

Attempt to unlock the doors and the liftgate by using the keyless operation key. If the doors and the liftgate are not locked within 30 seconds, carry out troubleshooting. Note that the doors and the liftgate will not be locked if the ignition key is inserted within the 30-second period, one of the doors or the liftgate is opened. Refer to P.42B-108.

NOTE: The operation time of the keyless entry timer lock function can be set using the customization function. Confirm the operation time before performing the diagnosis. Refer to P.42B-170.

CONFIGURATION FUNCTION

M14209100116USA0000010000

By using ETACS functions, KOS functions can be adjusted.

- Horn answerback function of the keyless entry system
  A function that sounds the horn when the doors are locked/unlocked by the keyless operation key to let the driver confirm that the doors are locked/unlocked even when he/she is away from the car
- KOS auto lock function
  A function that automatically locks the doors when the driver left the car without locking the doors
- In-car keyless operation key search
  A function that monitors the keyless operation key being brought out of the car through the car window
- KOS outer tone alarm answerback function
  A function that sounds the outer tone alarm when the doors are locked/unlocked by the keyless operation key to enable the driver confirm that the doors are locked/unlocked
- All KOS functions
  Enables/disables all KOS functions or enables either door entry function or engine starting function respectively.

Adjustment item (scan tool MB991958 display)	Adjustment item	Adjusting contents (scan tool MB991958 display)	Adjusting contents
Hazard answer back	Adjustment of the number of keyless hazard warning light answer back flashes	Lock:1, Unlock:2	LOCK: Flashes once, UNLOCK: Flashes twice (default)
		Lock:1, Unlock:0	LOCK: Flashes once, UNLOCK: No flash
		Lock:0, Unlock:2	LOCK: No flash, UNLOCK: Flash twice
		Lock:2, Unlock:1	LOCK: Flash twice, UNLOCK: Flash once
		Lock:2, Unlock:0	LOCK: Flash twice, UNLOCK: No flash
		Lock:0, Unlock:1	LOCK: No flash, UNLOCK: Flash once
		Lock:0, Unlock:0	Without function
Dome light delay timer with door	Adjustment of interior light delay shutdown time	0sec	0 second (no delay shutdown time)
		7.5sec	7.5 seconds
		15sec	15 seconds
		30sec	30 seconds (default)
		60sec	60 seconds
		120sec	120 seconds

Adjustment item (scan tool MB991958 display)	Adjustment item	Adjusting contents (scan tool MB991958 display)	Adjusting contents
		180sec	180 seconds
Door unlock mode	Door lock system	All doors unlock	All the doors are unlocked when the driver's side door is unlocked.
		Dr door unlock	Only the driver's side door is unlocked when the driver's side door is unlocked. (default)
Auto door unlock by P position	Auto door unlock by P position function	Disable	Without function (default)
		Always enabled	Always with function
		P/W unlocked	With function (with power window unlocked)
Duration of horn chirp	Horn sounding time during horn answer back	Short	0.01 second (default)
		Long	0.02 second
Horn chirp by RKE	Horn chirp by RKE	Not sound horn	No horn answerback function
		Lock any time	The horn sounds when the lock button of keyless entry transmitter is pressed once.
		W lock any time	The horn sounds when the lock button of keyless entry transmitter is pressed twice. (default)
Tone alarm answer back	Adjusts the tone alarm answer back function.	Not sound tone alarm	Without function
		At keyless key	Sounds when the keyless entry system is activated.
		At keyless	Sounds when KOS is activated (default).
		At Both	Sounds when the keyless entry system or KOS is activated.
Timer lock timer	Timer lock period adjustment	30sec	30 seconds (default)
		60sec	60 seconds
		120sec	120 seconds
		180sec	180 seconds
Duration pre-alarm	Adjustment of pre-alarm continue time	10 sec	10 seconds (default)
		6 sec	6 seconds
Alarm	With/without theft-alarm function	Disable	Without function
		Enable	With function (default)
Panic alarm switch	With/without panic alarm function	Disable	Without function
		Enable	With function (default)
Fob out of car	With/without KOS key exterior detection function	Disable	Without function (default)
		Enable	With function
KOS feature	KOS function adjustment	Both enable	All KOS functions are enabled (default).
		DoorEntry enable	Only door entry function is enabled.

Adjustment item (scan tool MB991958 display)	Adjustment item	Adjusting contents (scan tool MB991958 display)	Adjusting contents
		ENG strt enable	Only engine starting function is enabled.
		Both disabled	All KOS functions are disabled.
KOS unlock disable time	Adjusts the door unlock inhibition period after door lock is activated.	0sec	0 seconds
		3sec	3 seconds (default)
		5sec	5 seconds

TIRE PRESSURE SENSOR ID REGISTRATION

M14209100160USA0000010000

When the TPMS transmitter and/or KOS-ECU are replaced, execute "Tire Pressure Sensor ID Registration." The TPMS won't function until the "Tire Pressure Sensor ID Registration" has been complete.

Required Special Tools:

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

Register the tire pressure sensor IDs as described in the procedure below.

⚠ 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 "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Select "Special Function."
6. Select "Tire Pressure Sensor ID Registration."
7. Select "4tires ID Reg. (Change tire PRS.)" and start the tire pressure sensor ID registration.

⚠ CAUTION

Register all tire pressure sensor IDs within twenty minutes.

8. "4 SNSR ID Registration Do you want to start? Note Finish ID Registration within 20 minutes." is displayed. Then, press "OK."
9. Decrease the tire pressure to 174 kPa or less, and register the TPMS transmitter ID code of each wheel to KOS-ECU.

NOTE:

- *On completion of the TPMS transmitter ID code registration, the TPMS transmitter ID code is displayed on the M.U.T.-III screen.*

▪It may take approximately one minute for the ID code to be displayed on the M.U.T.-III screen after the tire pressure is reduced.
▪If the ID code is not displayed, reduce the tire pressure another 20 kPa or more. If the ID code is not displayed yet, rotate the tire to displace the TPMS transmitter, and reduce the tire pressure 20 kPa or more again.
▪You can start out the following operations from any TPMS transmitter. The tire pressure sensor ID registration has no order.

10. "4 SNSR ID Registration Completed." is displayed. Then, select "OK."

NOTE: The TPMS indicator illuminates for tire pressure alarm.

11. After tire pressure sensor ID registration, turn the ignition switch to the "LOCK" (OFF) position.
12. Remove scan tool MB991958.

TIRE PRESSURE SENSOR CHECK

M14209100161USA0000010000

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

Check the condition of the tire pressure sensor as described below.

⚠ 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 "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Select "Special Function."
6. Select "Tire Pressure Sensor Check."
7. "Tire Pressure Sensor Check. Do you want to start?" is displayed. Then, select "OK."
8. Change the pressure of tire to be checked for 20 kPa or more. (The tire pressure can either be decreased or increased.)
9. Check the data on the PC display.

NOTE:
▪It may take approximately one minute for the ID code to be displayed on the M.U.T.-III screen after the tire pressure is changed.

- *If the ID code is not displayed, change the tire pressure another 20 kPa or more. If the ID code is not still displayed, rotate the tire to displace the TPMS transmitter, and change the tire pressure 20 kPa or more again.*

10. After tire pressure sensor check, turn the ignition switch to the "LOCK" (OFF) position.
11. Remove scan tool MB991958.

TIRE PRESSURE SENSOR ID CHECK

M14209100162USA0000010000

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

Check the tire pressure sensor IDs, which is registered in the TPMS receiver, as described below.

⚠ 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 "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Special Function."
8. Select "Tire Pressure Sensor ID Check."
9. Check the tire pressure sensor IDs on the PC display.
10. After tire pressure sensor ID check, turn the ignition switch to the "LOCK" (OFF) position.
11. Remove scan tool MB991958.

FROM SCAN TOOL MB99158 DIAGNOSIS SCREEN

You can check the tire pressure sensor ID on the diagnosis screen as described below.

1. Operate scan tool MB991958 as follows:
   - Press "Special" button on the diagnosis screen.
   - Select "Tire Pressure Sensor ID Check" from the "Special Function" menu.
2. Check the tire pressure sensor IDs on the PC display.
3. After tire pressure sensor ID check, turn the ignition switch to the "LOCK" (OFF) position.
4. Remove scan tool MB991958.

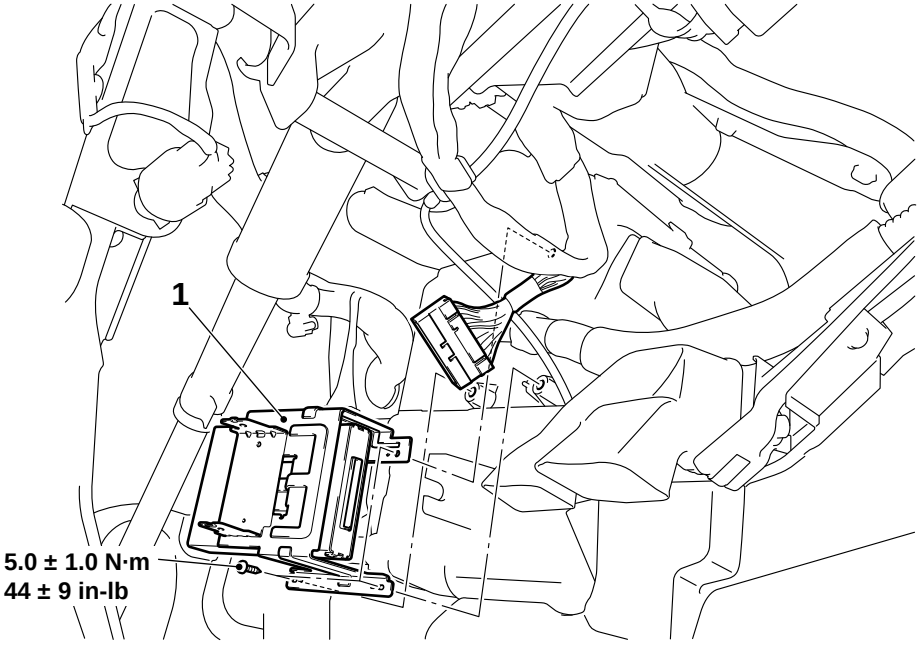
KOS-ECU

REMOVAL AND INSTALLATION

M14209100059USA0000010000

⚠ CAUTION

If KOS-ECU is replaced, refer to ID code registration need judgment table P.42B-12to complete the registration of each ID code.



ZC601250

	Removal Steps			Removal Steps
·	Instrument panel under trim (Refer to GROUP 52A - Instrument Panel Assembly P.52A-2.)	>>A<<	1.	KOS-ECU

INSTALLATION SERVICE POINT

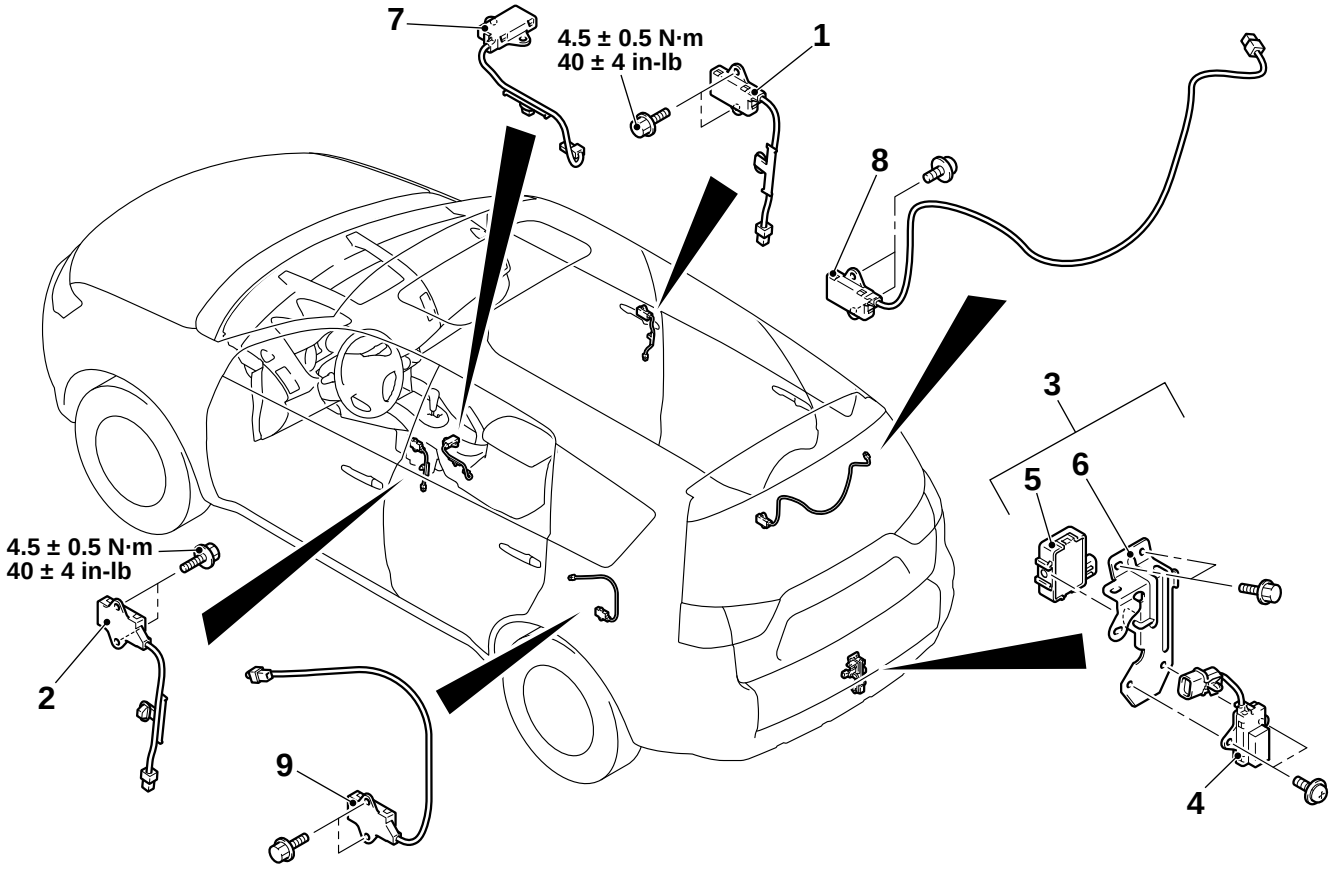
>>A<< KOS-ECU INSTALATION

Check that the top claw of KOS-ECU is fixed securely to the boss of steering lock and the antenna is not floating on the key cylinder.

EXTERIOR TRANSMITTER ANTENNA ASSEMBLY, INTERIOR TRANSMITTER ANTENNA ASSEMBLY, RECEIVER ANTENNA MODULE

REMOVAL AND INSTALLATION

M14209100062USA0000010000



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Exterior transmitter antenna assembly (front passenger's side) removal steps

- Center pillar trim <RH> (Refer to GROUP 52A, Interior Trim P. 52A-10.)

1. Exterior transmitter antenna assembly (front passenger's side)

Exterior transmitter antenna assembly (driver's side) removal steps

- Center pillar trim <LH> (Refer to GROUP 52A, Interior Trim P. 52A-10.)

2. Exterior transmitter antenna assembly (driver's side)

Antenna and tone alarm assembly removal steps

- Rear bumper assembly (Refer to GROUP 51A, Rear Bumper Assembly P.51A-5.)

3. Antenna and tone alarm assembly
4. Exterior transmitter antenna assembly (liftgate)
5. Tone alarm
6. Bracket

Interior transmitter antenna assembly (front) removal steps

- Rear floor console (Refer to GROUP 52A, Rear Floor Console Assembly P. 52A-9.)

7. Interior transmitter antenna assembly (front)

Interior transmitter antenna assembly (rear: front passenger's side) removal steps

- Quarter trim lower <RH> (Refer to GROUP 52A, Interior Trim P. 52A-10.)

8. Interior transmitter antenna assembly (rear: front passenger's side)

Interior transmitter antenna assembly (rear: driver's side) removal steps

- Quarter trim lower <LH> (Refer to GROUP 52A, Interior Trim P. 52A-10.)

9. Interior transmitter antenna assembly (rear: driver's side)

⚠ CAUTION

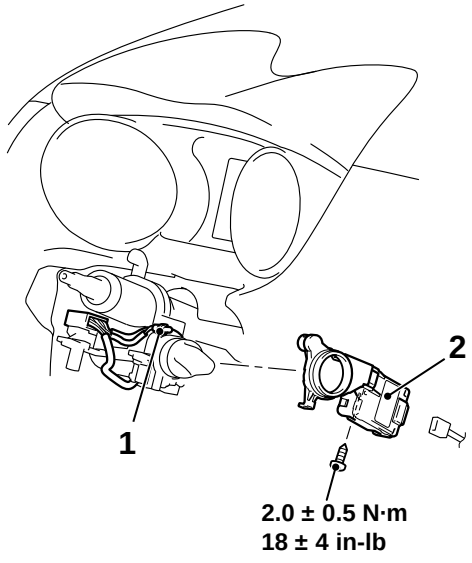
To remove the driver airbag module, refer to GROUP 52B, Service Precautions P.52B-28and Air Bag Module(s) and Clock Spring P.52B-329.

Pre-removal operation

- Lower panel and steering column cover removal (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2.)
- Clock spring column switch assembly removal (Refer to GROUP 37, Steering Shaft P.37-23or GROUP 52B, Air Bag Module(s) and Clock Spring P.52B-329.)

Post-installation operation

- Clock spring column switch assembly installation (Refer to GROUP 37, Steering Shaft P.37-23or GROUP 52B, Air Bag Module(s) and Clock Spring P.52B-329.)
- Lower panel and steering column cover installation (Refer to GROUP 52A, Instrument Panel Assembly P.52A-2.)



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Receiver antenna module removal steps

1. Key ring illumination light

Receiver antenna module removal steps

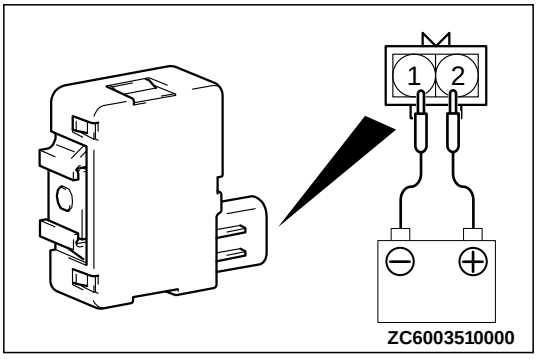
2. Receiver antenna module

INSPECTION

M14209100063USA0000010000

OUTER TONE ALARM CHECK

Check that the outer tone alarm sounds once when the terminals are connected to the battery as shown.

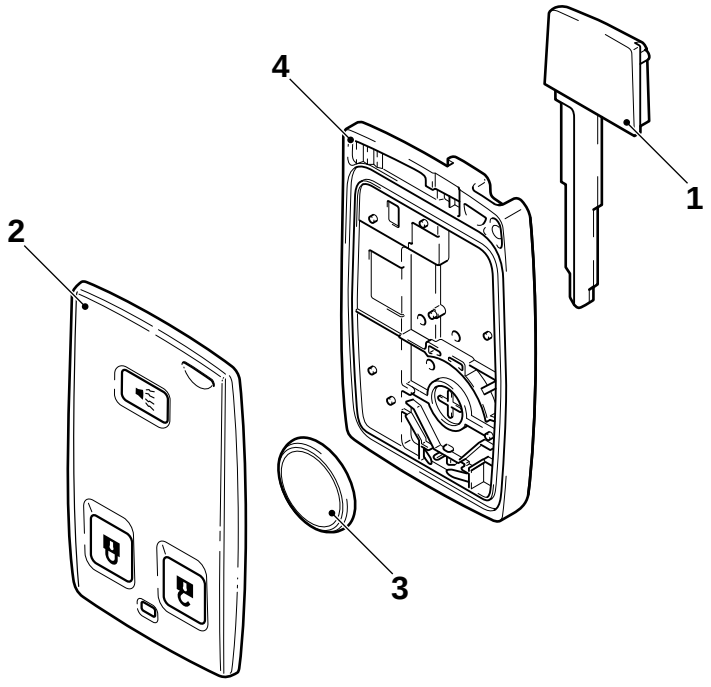


KEYLESS OPERATION KEY

DISASSEMBLY AND ASSEMBLY

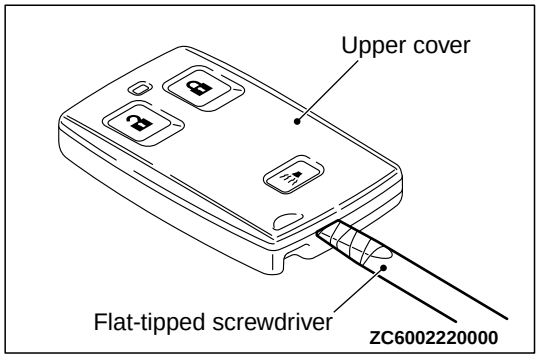
M14209100040USA0000010000

Post-installation operation
Operation check of the keyless operation key



			Disassembly steps			Disassembly steps
		1.	Emergency key	<<A>>	4.	Lower cover
<<A>>		2.	Upper cover			
<<A>>	>>A<<	3.	Battery			

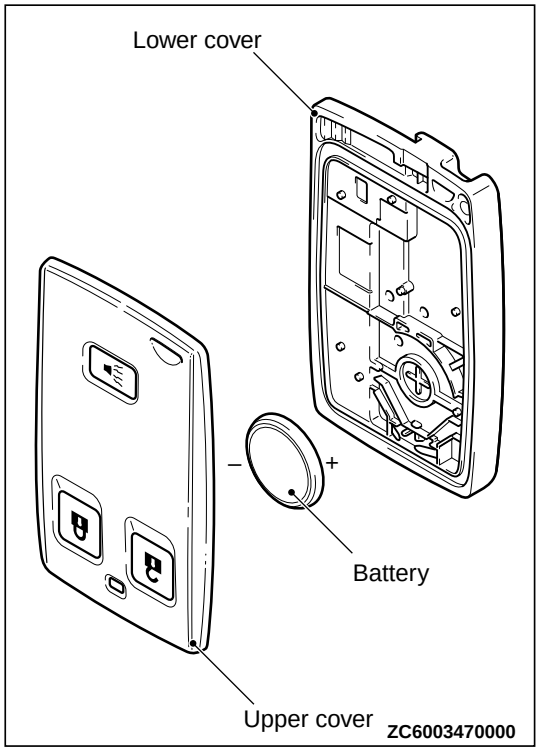
DISASSEMBLY SERVICE POINT



<<A>> UPPER COVER/BATTERY/LOWER COVER REMOVAL

Place a flat-tipped screwdriver wrapped with protective tape as shown in the figure, and lever the keyless operation key to remove.

ASSEMBLY SERVICE POINT



>>A<< BATTERY INSTALLATION

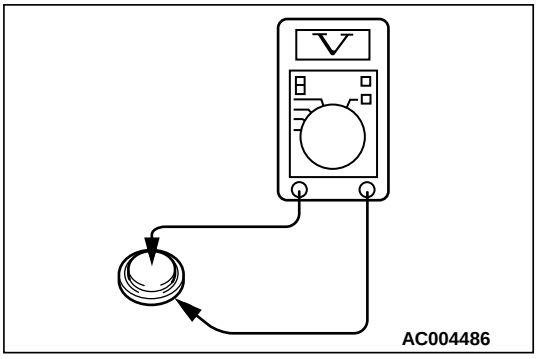
Install a new battery with the positive side facing toward the lower cover.

Replacement battery: Coin-type lithium battery CR2032

INSPECTION

M14209100041USA0000010000

KEYLESS OPERATION KEY BATTERY CHECK



Measure the voltage of the battery. If the voltage of the battery is lower than the standard value, replace the battery.

Standard value:2.5 - 3.2 V

TPMS TRANSMITTER

REMOVAL AND INSTALLATION

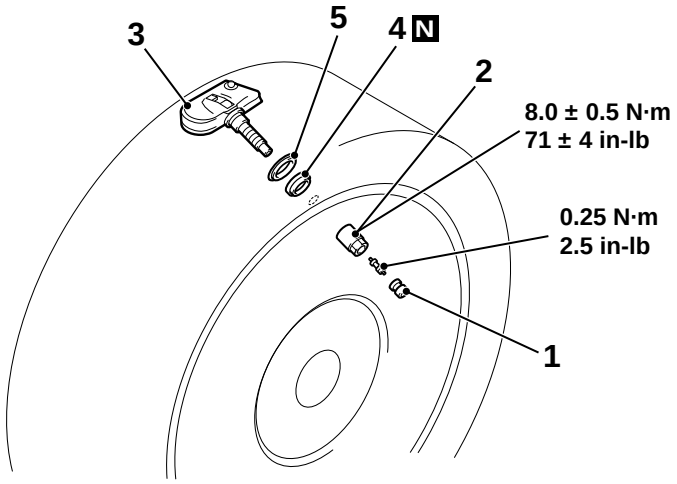
M14209100164USA0000010000

⚠ CAUTION

- **Ensure valve cap is always in place except when adjusting tire pressure.**
- **If the valve core and valve cap are replaced, use a genuine replacement part. The valve core is similar to a conventional one, but uses nickel plating to avoid corrosion.**
- **Replace the valve stem grommet and washer with a new one every five years or when the tire is replaced.**
- **Do not drop the TPMS transmitter from height greater than 1 meter (3.3 feet).**
- **Do not expose the TPMS transmitter to extraneous magnetic fields.**
- **TPMS transmitter should not be stored at temperatures above 80°C (176°F).**
- **TPMS transmitter should not be exposed to temperatures above 100°C (212°F).**
- **If the TPMS transmitter is replaced, execute "Tire Pressure Sensor ID Registration" on scan tool MB99158 "Special Function."**

Pre-removal Operation
- Wheel and Tire Removal

Post-installation Operation
- Wheel and Tire Installation
- Tire Pressure Sensor ID Registration If a new TPMS transmitter is installed (Refer to P.42B-172.)
- After the tire pressure sensor ID registration, check that the TPMS warning light does not illuminate or flash.



ZC6045420000

			REMOVAL STEPS
<<A>>		1.	VALVE CAP
<<A>>		2.	VALVE NUT
		·	LET TPMS TRANSMITTER FALL INTO TIRE
		·	TIRE BEAD
<<B>>		3.	TPMS TRANSMITTER
<<C>>		4.	GROMMET
<<C>>		5.	WASHER
			INSTALLATION STEPS
	>>A<<	5.	WASHER

		INSTALLATION STEPS
>>A<<	4.	GROMMET
>>A<<	3.	TPMS TRANSMITTER
>>A<<	2.	VALVE NUT
>>B<<	·	TIRE BEAD MOUNTING
>>C<<	·	TIRE PRESSURE INFLATION
>>C<<	·	VALVE NUT RETIGHTENING
	1.	VALVE CAP

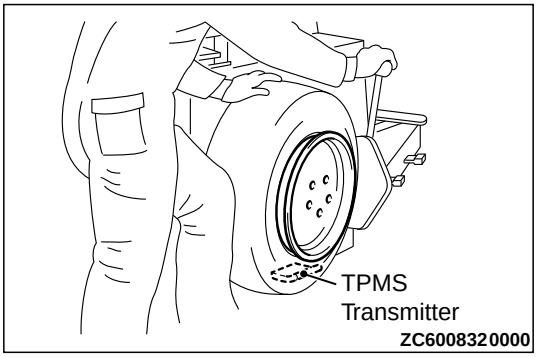
REMOVAL SERVICE POINTS

<<A>> VALVE CAP/VALVE NUT REMOVAL

⚠ CAUTION

Ensure valve cap is always in place except when adjusting tire pressure.

1. Remove the valve cap.
2. Rotate tire so that valve stem is in the 6 o'clock position.
3. Use a long-reach 17.2 mm (0.68 inch) socket to unscrew the valve nut and remove it. Slowly push valve stem into tire so that tire pressure is released.
4. Once tire pressure is released, let TPMS transmitter into tire.



<<B>> TPMS TRANSMITTER REMOVAL

1. Place on tire changing machine and break both tire beads ensuring that the transmitter remains in the bottom of the tire.

⚠ CAUTION

Be careful not to damage the TPMS transmitter.

2. Lubricate tire well and remove outer side of the tire.
3. Reach inside the tire and remove the TPMS transmitter.
4. Remove tire from rim using proper tire changing equipment procedures.

<<C>> GROMMET/WASHER REMOVAL

⚠ CAUTION

- **Do not vary the angle of valve except at mounting on the rim. If varying the angle over and over, it may cause breakage of antenna plate resulting in the failure of transmitter.**
- **Use a soft tool to remove the grommet and washer to prevent scratching the valve of the TPMS transmitter.**

Remove the grommet and washer from the TPMS transmitter.

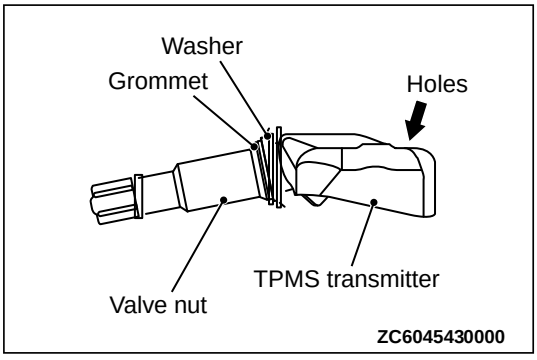
INSTALLATION SERVICE POINTS

>>A<< GROMMET/WASHER/TPMS TRANSMITTER/VALVE NUT INSTALLATION

⚠ CAUTION

When installing a new grommet and washer, make sure to support the valve stem base with a thumb so that there is no movement of the stem. Otherwise, the stem may protrude resulting in the breakage of antenna plate.

1. Install a new grommet and washer to the TPMS transmitter.



⚠ CAUTION

- **Visually check that TPMS transmitter is not deformed or damaged.**
- **When installing the TPMS transmitter, be sure the rim, grommet and valve nut are clean.**
- **Ensure the grommet is located inside the valve hole before installing the valve nut.**
- **While installing the valve nut, push the transmitter to maintain the lower lip of the transmitter case is in contact with the rim without clearance.**
- **While installing the valve nut, ensure the tool is kept aligned to the valve and the valve hole.**
- **After installing the valve nut, check that the grommet is compressed and washer is bend.**

2. Mount TPMS transmitter valve through rim hole as illustrated. Pressure holes in the transmitter case should face away from center of rim. Tighten valve nut finger tight, then slowly torque the valve nut to 8.0 ± 0.5 N·m (71 ± 4 in-lb).

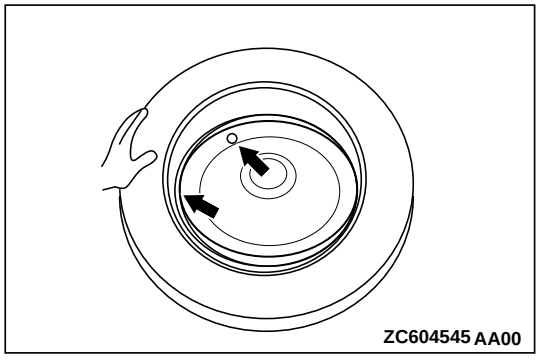
⚠ CAUTION

Install the TPMS transmitter correctly. If the TPMS transmitter is installed incorrectly, it may not work correctly, or become damaged when the tire is installed.

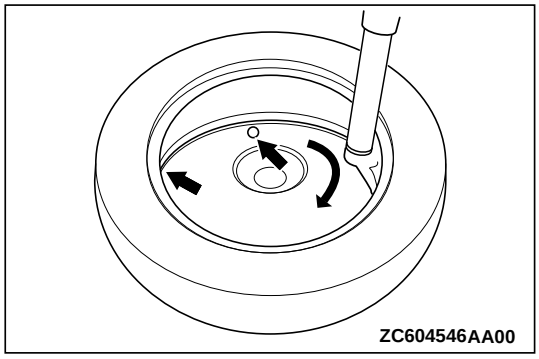
3. Check that the TPMS transmitter is correctly assembled (Refer to illustration).
   - Lower lip of the TPMS transmitter case is touching the rim after torquing.

>>B<< TIRE BEAD MOUNTING

1. Put the tire on the rim, so that the cross point of the belt with the rim is approximately 20 cm (7.9 inch) away from the valve

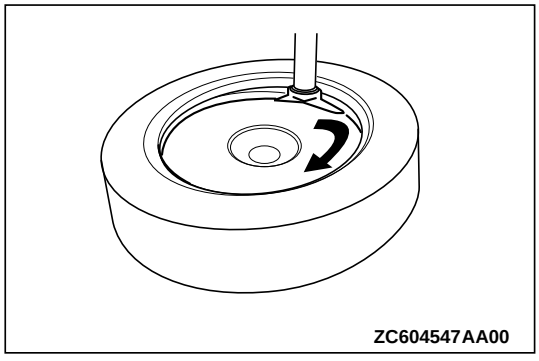

ZC604545AA00

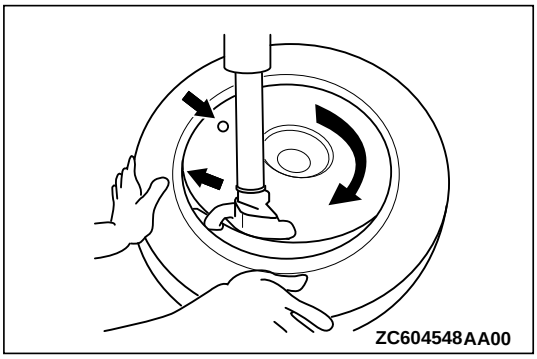
2. Engage the shoe and make sure that 20 cm (7.9 inch) is maintained between the cross point and the valve. The arrow shows the direction of rotation of the wheel.


ZC604546AA00

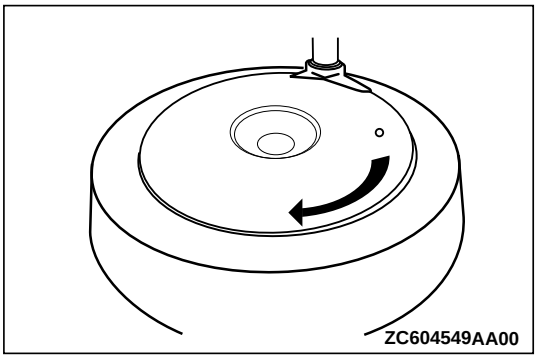
3. Turn the wheel in order to engage all the first side of the tire.

NOTE: The standard shoes can pass over the sensor without damaging it.


ZC604547AA00


ZC604548AA00

4. Put the second side of the tire in position, so that the cross point of the belt with the rim is approximately 20 cm (7.9 inch) away from the valve. the curved arrow shows the direction of rotation of the wheel.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5. Turn the wheel in order to engage all of the second side of the tire.

NOTE: The standard shoes can pass over the sensor without damaging it.

>>C<< TIRE PRESSURE INFLATION/VALVE NUT RETIGHTENING

⚠ CAUTION

After tire inflation, retighten the valve nut to 8.0N·m (71 inch pounds). This is necessary, because the TPMS transmitter is secured to the wheel with the valve nut and rubber grommet. The rubber grommet will be depressed by tire pressure or deteriorate over a period of time, which requires the valve nut to be retightened.

Inflate tire to required pressure, then retorque the valve nut to 8.0 N·m (71 inch pounds).