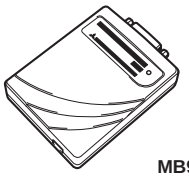
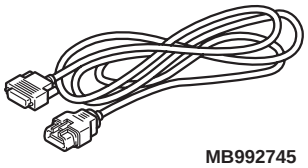
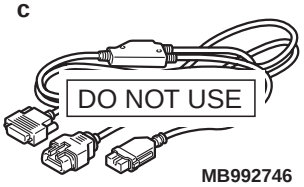
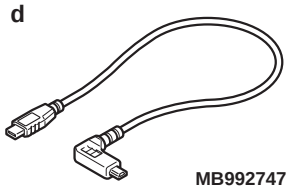
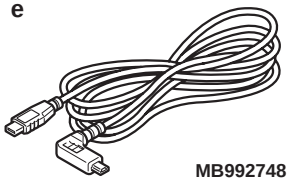
GROUP 42B

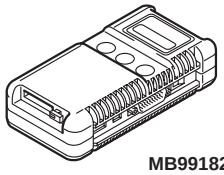
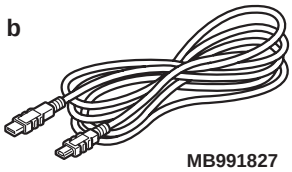
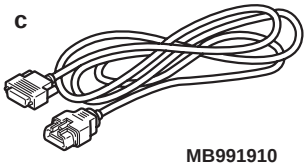
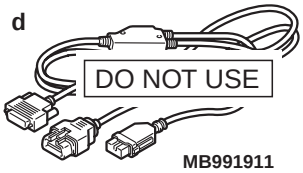
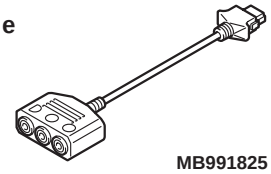
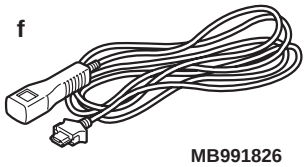
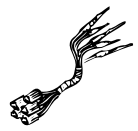
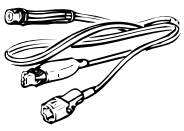
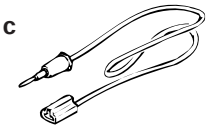
KEYLESS OPERATION SYSTEM (KOS)

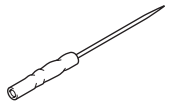
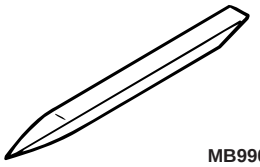
CONTENTS

SPECIAL TOOLS

M1429604300145

Tool	Number	Name	Use
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	• Diagnosis code, service data, actuator test check • Registration of ID codes

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (for vehicles with CAN communication) d. M.U.T.-III main harness B (for vehicles without CAN communication) e. Measuring adapter harness f. M.U.T.-III trigger harness	⚠ CAUTION **For vehicles with CAN communication, use the M.U.T.-III main harness A to send simulated vehicle speed. If you connect the M.U.T.-III main harness B instead, the CAN communication does not function correctly.** • Diagnosis code, service data, actuator test check • Registration of ID codes
a  b  c  d  MB991223	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222	Wiring harness set a. Check harness b. LED harness c. LED harness adapter d. Probe	Continuity check and voltage measurement at harness wire or connector a. For checking connector pin contact pressure b. For checking power supply circuit c. For checking power supply circuit d. For connecting a locally sourced tester

Tool	Number	Name	Use
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector
 MB990784	MB990784	Ornament remover	Steering column cover removal

TROUBLESHOOTING <KOS-ECU>

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1429604400056

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points .

DIAGNOSTIC FUNCTION

M1429605400372

HOW TO READ DIAGNOSIS CODE

Refer to GROUP 00 – How to Use Troubleshooting and Inspection Service Points .

HOW TO ERASE DIAGNOSIS CODE

Refer to GROUP 00 – How to Use Troubleshooting and Inspection Service Points .

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using the M.U.T.-III.

When detecting fault and storing the diagnosis code, the ECU connected to CAN bus line obtains the data before the determination of the diagnosis code and the data when the diagnosis code is determined, and then stores the ECU status of that time. By analysing each data from M.U.T.-III, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

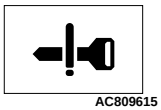
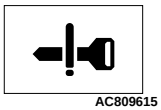
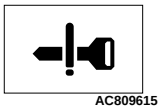
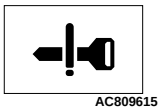
Display item list

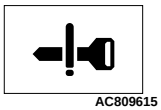
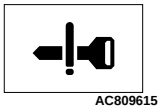
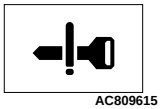
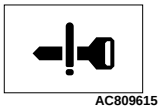
Item No.	Item name	Data item	Unit
1	Odometer	Total driving distance after the diagnosis code is generated	km
2	Ignition cycle	Number of times the power supply mode is turned "ON" or "OFF" after the past trouble transition.	Number of counts is displayed.
4	Current trouble accumulative time	Cumulative time for current malfunction of diagnosis code	min

WARNING AND WARNING INDICATOR LIST <Standard meter>

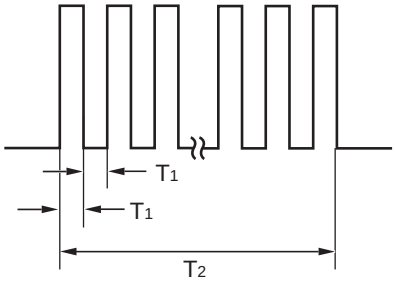
M1429612300623

When KOS failed or operated improperly, KOS-ECU warns the driver of this by setting off the outer buzzer and the keyless operation warning indicator on the combination meter.

Item	Indicator	State	Warning operation	Warning cancellation condition (when any of the condition met)
Keyless operation key battery low voltage warning	 AC809615	The keyless operation key with low battery voltage is detected when the engine switch is pressed.	Warning indicator flashes for 30 seconds.	• Power supply mode OFF is detected. • 30 seconds have passed after the warning output started.
Keyless operation key take out warning	 AC809615	The keyless operation key is carried out of the vehicle when the power supply mode is in other than OFF, and the door is closed.	• The warning indicator flashes for 5 minutes. • Outer buzzer sounds for 5.69 seconds in pattern 2.	• Power supply mode OFF is detected. • KOS-ECU has detected a keyless operation key inside the vehicle. • 5 minutes have passed when the power supply mode is in ACC.
Door lock does not operate (keyless operation key is located inside the vehicle).	 AC809615	The lock/unlock switch on the front door outside handle (driver's side, front passenger's side) or the tailgate lock release handle (tailgate open switch, tailgate lock switch) are pressed when the keyless operation key is still located inside the car.	• Warning indicator flashes for 5 seconds. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• The lock/unlock switch on the front door outside handle (driver's side, front passenger's side) or tailgate lock release handle (tailgate open switch, tailgate lock switch) are pressed again. • 5 seconds have passed after the warning output started.
Door lock does not operate (door open).	 AC809615	The lock/unlock switch on the front door outside handle (driver's side, front passenger's side) or the tailgate lock release handle (tailgate open switch, tailgate lock switch) are pressed when the door is ajar.	• Warning indicator flashes for 5 seconds. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• All doors are closed. • 5 seconds have passed after the warning output started.

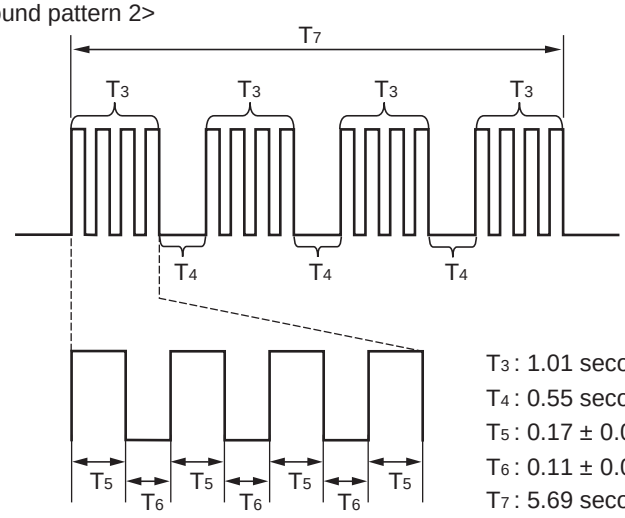
Item	Indicator	State	Warning operation	Warning cancellation condition (when any of the condition met)
System error	 AC809615	Engine switch is pressed when an error has been detected in EEPROM of KOS-ECU.	The warning indicator illuminates for 5 minutes.	5 minutes have passed after the alarm is output, also the power supply mode is OFF
		Engine switch is pressed when a transmission antenna has an open circuit or short to power supply.		
		Open circuit or short to earth is detected in the key slot.		
		An error is detected, and the power supply mode is other than OFF.		
No keyless operation key detected inside the car	 AC809615	No keyless operation key is detected inside the car when the engine switch is pressed.	The warning indicator flashes for 5 seconds.	• Power supply mode OFF is detected. • 5 seconds have passed after the warning output started.
Key reminder	 AC809615	With the driver's door kept open, the keyless operation key is not removed from the key slot located in the floor console.	• The warning indicator flashes for 1 minute. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• Key is removed from the key slot in the floor console. • 1 minutes have passed after the warning output started.
Engine switch reminder	 AC809615	The lock/unlock switch on the front door outside handle (driver's side, front passenger's side) or the tailgate lock release handle (tailgate open switch, tailgate lock switch) are pressed when the power supply mode is other than OFF.	• Warning indicator flashes for 5 seconds. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• Power supply mode OFF is detected. • 5 seconds have passed after the warning output started.

<Sound pattern 1>



T1 : 0.08 ± 0.01 seconds
T2 : 2.96 seconds

<Sound pattern 2>



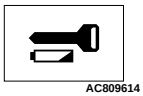
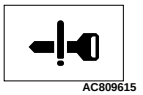
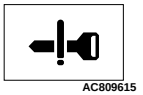
T3 : 1.01 seconds
T4 : 0.55 seconds
T5 : 0.17 ± 0.01 seconds
T6 : 0.11 ± 0.01 seconds
T7 : 5.69 seconds

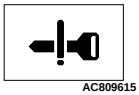
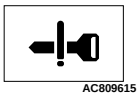
AC501053AC

WARNING AND WARNING INDICATOR LIST <High contrast meter>

M1429612300634

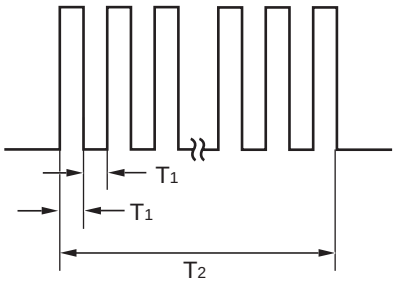
When KOS failed or operated improperly, KOS-ECU warns the driver of this by setting off the outer buzzer and the keyless operation warning indicator on the multi information display in the combination meter.

Item	Display content		State	Warning operation	Warning cancellation condition (when any of the condition met)
Keyless operation key battery low voltage warning	 AC809614	KEY BATTERY LOW	The keyless operation key with low battery voltage is detected when the engine switch is pressed.	Warning indicator display for 30 seconds.	• Power supply mode OFF is detected. • 30 seconds have passed after the warning output started.
Keyless operation key take out warning	 AC809615	KEY NOT DETECTED	The keyless operation key is carried out of the vehicle when the power supply mode is in other than OFF, and the door is closed.	• The warning indicator display for 5 minutes. • Outer buzzer sounds for 5.69 seconds in pattern 2.	• Power supply mode OFF is detected. • KOS-ECU has detected a keyless operation key inside the vehicle. • 5 minutes have passed when the power supply mode is in ACC.
Door lock does not operate (keyless operation key is located inside the vehicle).	 AC809615	KEY STILL IN VEHICLE	The lock/unlock switch of the front door outside handle is pressed when the keyless operation key is still located inside the car.	• Warning indicator display for 5 seconds. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• Lock/unlock switch of the front door outside handle is pressed again. • 5 seconds have passed after the warning output started.

Item	Display content		State	Warning operation	Warning cancellation condition (when any of the condition met)
Door lock does not operate (door open).	 AC809615	CHECK DOORS	The lock/unlock switch on the front door outside handle is pressed when the door is ajar.	• Warning indicator display for 5 seconds. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• All doors are closed. • 5 seconds have passed after the warning output started.
System error	 AC809615	KEYLESS OPERATION SYSTEM SERVICE REQUIRED	Engine switch is pressed when an error has been detected in EEPROM of KOS-ECU.	The warning indicator display for 5 minutes.	5 minutes have passed after the engine switch is pressed, also the power supply mode is OFF.
			Engine switch is pressed when a transmission antenna has an open circuit or short to power supply.		
			Open circuit or short to earth is detected in the key slot.		
			An error is detected, and the power supply mode is other than OFF.		
No keyless operation key detected inside the car	 AC904250	KEY NOT DETECTED INSERT KEY INTO KEY SLOT	No keyless operation key is detected inside the car when the engine switch is pressed.	The warning indicator display for 5 seconds.	• Power supply mode OFF is detected. • 5 seconds have passed after the warning output started.
Key reminder	 AC904251	REMOVE KEY FROM KEY SLOT	With the driver's door kept open, the keyless operation key is not removed from the key slot.	• The warning indicator display for 1 minute. • Outer buzzer sounds for 2.96 seconds in pattern 1.	• Key is removed from the key slot. • 1 minutes have passed after the warning output started.

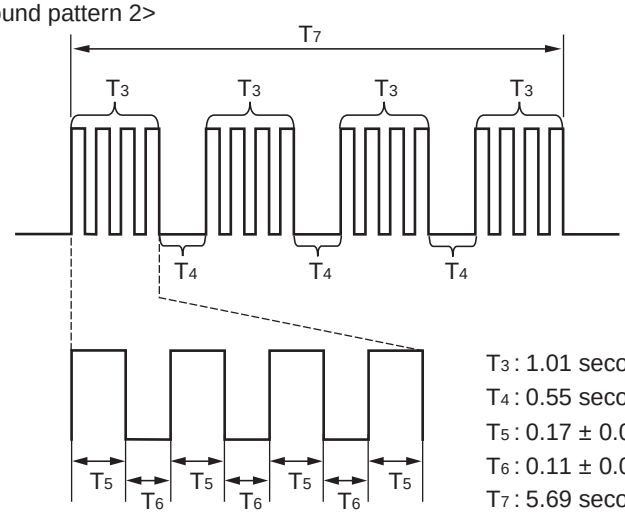
Item	Display content		State	Warning operation	Warning cancellation condition (when any of the condition met)
Engine switch reminder		–	The lock/unlock switch on the front door outside handle (driver's side, front passenger's side) or the tailgate lock release handle (tailgate open switch, tailgate lock switch) are pressed when the power supply mode is other than OFF.	• Warning indicator display for 5 seconds. • Outer buzzer sounds for 2.96 seconds in pattern 1.	5 minutes have passed after the engine switch is pressed, also the power supply mode is OFF.

<Sound pattern 1>



T1 : 0.08 ± 0.01 second
T2 : 2.96 seconds

<Sound pattern 2>



T3 : 1.01 seconds
T4 : 0.55 second
T5 : 0.17 ± 0.01 second
T6 : 0.11 ± 0.01 second
T7 : 5.69 seconds

AC501053AE

DIAGNOSIS CODE CHART

M1429600200953

Diagnosis code No.	Diagnostic item	Reference page
B1761	Chassis No.not programmed	P.42B-13
B1770	Implausible coding data	P.42B-13
B1A08	Keyless/KOS key1 performance	P.42B-14
B1A09	Keyless/KOS key2 performance	
B1A0A	Keyless/KOS key3 performance	
B1A0B	Keyless/KOS key4 performance	
B1A10	Keyless/KOS key 1 low battery	P.42B-15
B1A11	Keyless/KOS key 2 low battery	
B1A12	Keyless/KOS key 3 low battery	
B1A13	Keyless/KOS key 4 low battery	

Diagnosis code No.	Diagnostic item	Reference page
B1A24	Key ID not registered	P.42B-15
B1A25	Key ID unmatched	P.42B-16
B2101	IG SW start POS circuit low	P.42B-17
B2102	IG SW start POS circuit high	
B2204	Coding data mismatch	P.42B-18
B2206	Chassis No. mismatch	P.42B-19
B2352	Antenna fail	P.42B-19
B2400	KOS key registration fail	P.42B-20
B2401	Keyless/KOS key ID not registered	P.42B-21
B240A	DR side antenna(outdoor) open	P.42B-21
B240B	PS side antenna(outdoor) open	P.42B-22
B240C	Tail gate antenna(outdoor) open	P.42B-22
B240D	Front antenna(indoor) open	P.42B-23
B240E	RR antenna(indoor) open	P.42B-24
B2416	ECU internal error	P.42B-25
B2417	OSS authentification error*1	P.42B-25
B2418	OSS authentification timeout*1	P.42B-25
B2419	LF antenna voltage short*2	P.42B-26
B241A	ESL power control circuit earth*3	P.42B-27
B241B	ESL power control circuit open*3	
U0141	ETACS CAN timeout	P.42B-27
U0155	Meter CAN timeout	P.42B-28
U0164	A/C-ECUCAN timeout	P.42B-29
U0230	Electric tailgate control unit CAN timeout	P.42B-30
U0245	AND CAN timeout	P.42B-30
U1000	OSS CAN timeout*1	P.42B-31
U1190	No receive fault detect signal	P.42B-31
U1195	Coding not completed	P.42B-32

NOTE:

- **1: OSS = One-touch start system*
- **2: LF= Low frequency*
- **3: ESL = Electronic steering lock*

DIAGNOSIS CODE PROCEDURES

Code No.B1761 Chassis No. not programmed

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

TROUBLE JUDGMENT
KOS-ECU sets diagnosis code No. B1761 when no chassis number is recorded in it.

JUDGMENT CRITERIA
KOS-ECU determines that the abnormality is present when no chassis number is recorded in it.

PROBABLE CAUSES
- Malfunction of CAN bus line
- Chassis No. not programmed
- Malfunction of the KOS-ECU

DIAGNOSIS PROCEDURE
1. M.U.T.-III CAN bus diagnostics.
2. Register the chassis No. and recheck the diagnosis code.

Code No.B1770 Implausible coding data

⚠ CAUTION
- **When diagnosis code No. B1770 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION
If incorrect vehicle information data is received, KOS-ECU sets the diagnosis code No. B1770.

JUDGEMENT CRITERIA
If incorrect global coding data is received with the ignition switch turned ON when the coding confirmation is completed, KOS-ECU determines that there is a problem.

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

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III other system diagnosis code
Check if a coding-related diagnosis code is set in the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Perform troubleshooting for ETACS-ECU (Refer to GROUP 54A – ETACS – Troubleshooting).
NO : Go to Step 3.

STEP 3. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Turn the engine switch from the LOCK (OFF) position to the ON position.
(2) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Check if the coding data is sent for the vehicles with immobilizer function on "non-adaptable" condition. If so, change the immobilizer function into "adaptable", and then go to Step 4.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 4. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

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

(2) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

NO : The procedure is complete.

Code No.B1A08 Keyless/KOS key1 performance
Code No.B1A09 Keyless/KOS key2 performance
Code No.B1A0A Keyless/KOS key3 performance
Code No.B1A0B Keyless/KOS key4 performance

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

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 diagnosis code No. B1A08, B1A09, B1A0A or B1A0B.

JUDGMENT CRITERIA

- 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.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Synchronise the rolling code and recheck the diagnosis code.

(1) Synchronise the rolling codes as follows:
- Push the lock switch or unlock switch of keyless operation key twice or more.
- When the keyless operation is not recovered after performing the above procedure, register the key again (refer to P.42B-88).

(2) Recheck if the diagnosis code is set.
a. Push the lock switch or unlock switch of keyless operation key.
b. Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Go to Step 2

NO : The diagnosis is complete.

STEP 2. Check whether the diagnosis code is reset.

Replace the keyless operation key for which the diagnosis code is set with a new one, register the key (refer to P.42B-88), and then check whether the diagnosis code is set again.

(1) Push the lock switch or unlock switch of keyless operation key.

(2) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

NO : The diagnosis is complete.

Code No.B1A10 Keyless/KOS key 1 low battery
Code No.B1A11 Keyless/KOS key 2 low battery
Code No.B1A12 Keyless/KOS key 3 low battery
Code No.B1A13 Keyless/KOS key 4 low battery

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

DIAGNOSTIC FUNCTION

If KOS-ECU receives the keyless operation key low battery voltage signal, KOS-ECU sets the diagnosis code No. B1A10, B1A11, B1A12, or B1A13.

JUDGMENT CRITERIA

- 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.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

1. Replace the battery in the keyless operation key and recheck the diagnosis code.
2. Replace the keyless operation key and recheck the diagnosis code.

Code No.B1A24 Key ID not registered

⚠ CAUTION
- **When the diagnosis code No. B1A24 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION

KOS-ECU sets the diagnosis code No. B1A24 when the key ID was not registered in it.

JUDGMENT CRITERIA

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

PROBABLE CAUSES

- Malfunction of CAN bus line
- Key ID not registered
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnostics
2. Register the key ID and recheck the diagnosis code.

Code No.B1A25 Key ID unmatched

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

DIAGNOSTIC FUNCTION
The KOS-ECU stores diagnosis code No. B1A25 when the received key ID is different from the registered one or the key slot cannot communicate with the key correctly.

JUDGEMENT CRITERIA
KOS-ECU determines that the abnormality is present, if the key ID does not match the one registered in it when the engine switch is turned ON by the keyless operation key.

PROBABLE CAUSES
- Malfunction of the keyless operation key
- Malfunction of KOS-ECU
- Key is registered to another vehicle

DIAGNOSIS PROCEDURE

STEP 1. All of the registered keyless operation keys should allow the engine switch to be turned from OFF to ACC, ON, START positions.
(1) Prepare all of the registered keyless operation keys.
(2) Remove the batteries from all of the keyless operation keys (Refer to P.42B-98).
(3) Insert one of the keyless operation keys into the key slot.
(4) Check whether the engine switch can be turned from LOCK (OFF) to ACC, ON, START positions.
(5) Turn the engine switch to LOCK (OFF) position again.
(6) Repeat the same procedure for the other keyless operation keys.
(7) Install the batteries to all the keyless operation keys.

Q: Is the check result normal?
The engine switch can be turned from LOCK (OFF) to ACC, ON, START positions by operating all of the keyless operation keys. : Check if the diagnosis code is set. If the diagnosis code is erased, the diagnosis is complete. If not, go to Step 3.
The engine switch cannot be turned from LOCK (OFF) to ACC, ON, START positions by operating all of the keyless operation keys. : diagnosis code No. Check whether diagnosis code B2352 is stored.diagnosis code No. If diagnosis code B2352 is stored, go to the troubleshooting (Refer to P.42B-19). Repeat Step 1.diagnosis code No. If diagnosis code B2352 is not stored, go to Step 2.

STEP 2. Register the keyless operation key(s) which cannot activate the engine switch again.
Register the keyless operation key(s) which cannot activate the engine switch again (Refer to P.42B-88).

Q: Is the check result normal?
All of the keyless operation keys can be registered again. : Go to Step 3
All of the keyless operation keys cannot be registered again. : The keyless operation key(s), which cannot be registered, is defective. Put it aside. Go to Step 3

STEP 3. Register all of the keyless operation keys again.
(1) Register all of the registered keyless operation keys again (Refer to P.42B-88).
NOTE: Exclude the keyless operation key(s) which you put aside on Step 2.
(2) Remove the batteries from all of the keyless operation keys (Refer to P.42B-98).
(3) Insert one of the keyless operation keys into the key slot.
(4) Check whether the engine switch can be turned from LOCK (OFF) to ACC, ON, START positions.
(5) Turn the engine switch to LOCK (OFF) position again.
(6) Repeat the same procedure for the other keyless operation keys.
(7) Install the batteries to all the keyless operation keys.

Q: Is the check result normal?

The engine switch can be turned from LOCK (OFF) to ACC, ON, START positions by operating all of the keyless operation keys. : Check if the diagnosis code is set. If the diagnosis code is erased, the diagnosis is complete. If not, go to Step 5.

The engine switch cannot be turned from LOCK (OFF) to ACC, ON, START positions by operating all of the keyless operation keys. : Go to Step 4

STEP 4. Replace the keyless operation key(s) which cannot activate the engine switch with a new one.

(1) Replace the keyless operation key(s) which cannot activate the engine switch with a new one.
(2) Register a new keyless operation key (Refer to P.42B-88).
(3) Check that all of the registered keyless operation keys allow the engine switch to be turned from OFF to ACC, ON, START positions.
   a. Remove the batteries from all of the keyless operation keys (Refer to P.42B-98).
   b. Insert one of the keyless operation keys into the key slot.
   c. Check whether the engine switch can be turned from LOCK (OFF) to ACC, ON, START positions.
   d. Turn the engine switch to LOCK (OFF) position again.
   e. Repeat the same procedure for the other keyless operation keys.
   f. Install the batteries to all the keyless operation keys.

Q: Is the check result normal?
YES : Go to Step 6
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

STEP 5. Replace the KOS-ECU, and then register all of the keyless operation keys again.

(1) Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
(2) Register all of the keyless operation keys again (Refer to P.42B-88).
(3) Check that all of the registered keyless operation keys allow the engine switch to be turned from OFF to ACC, ON, START positions.
   a. Remove the batteries from all of the keyless operation keys (Refer to P.42B-98).
   b. Insert one of the keyless operation keys into the key slot.
   c. Check whether the engine switch can be turned from LOCK (OFF) to ACC, ON, START positions.
   d. Turn the engine switch to LOCK (OFF) position again.
   e. Repeat the same procedure for the other keyless operation keys.
   f. Install the batteries to all the keyless operation keys.

Q: Is the check result normal?
YES : Go to Step 6
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

STEP 6. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B2101 IG SW start POS circuit low
Code No.B2102 IG SW start POS circuit high

⚠ CAUTION

- **If the diagnosis code No. 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.**

TROUBLE JUDGEMENT

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

JUDGEMENT CRITERIA

If the engine switch status is infeasible consecutively ten times the KOS-ECU will judge that the system is defective.

B2101

- Engine switch power supply mode: OFF
- Engine switch information from ETACS-ECU: ON

B2102

- Engine switch power supply mode: ON
- Engine switch information from ETACS-ECU: OFF

PROBABLE CAUSES

- Malfunction of CAN bus line
- Malfunction of the KOS-ECU
- Malfunction of the OSS-ECU
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU

DIAGNOSTIC PROCEDURE

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

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

Q: Is the check result normal?

YES : Go to Step 2

NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting). On completion, go to Step 2.

STEP 2. M.U.T.-III other system diagnosis code

Check if any diagnosis code is set to the OSS-ECU.

Q: Is the diagnosis code set?

YES : Perform troubleshooting for the OSS-ECU (Refer to Troubleshooting P.42B-11). On completion, go to Step 3.

NO : Go to Step 3

STEP 3. M.U.T.-III other system data list

Use M.U.T.-III to check the ETACS-ECU service data. (Refer to GROUP 54A – ETACS-ECU, Service Data Reference List).

- Item 254: IG voltage

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 4

NO : Perform troubleshooting for ETACS-ECU (Refer to GROUP 54A – ETACS-ECU – Troubleshooting).

STEP 4. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B2204 Coding data mismatch

⚠ CAUTION

- **When the diagnosis code No. B2204 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION

If the vehicle information data on the CAN bus lines is different from that registered with KOS-ECU, KOS-ECU sets the diagnosis code No. B2204.

JUDGMENT CRITERIA

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.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnostics
2. M.U.T.-III other system diagnosis code
3. Check whether the diagnosis code is reset.

Code No.B2206 Chassis No. mismatch

DIAGNOSIS FUNCTION
KOS-ECU sets diagnosis code No. B2206 when chassis number registered in it and chassis number that has been transmitted on the CAN bus do not match.

JUDGEMENT CRITERIA
KOS-ECU determines that the abnormality is present when chassis number registered in it and the one that has been transmitted on the CAN bus do not match.

PROBABLE CAUSES
- Malfunction of KOS-ECU (KOS-ECU being registered to another vehicle)
- Malfunction of engine-ECU (Chassis number registered in engine-ECU unmatched)

DIAGNOSIS PROCEDURE
1. Check of chassis number registered in the engine-ECU and matching check of vehicle's chassis number.
2. Check whether the diagnosis code is reset (KOS-ECU).
3. Check whether the diagnosis code is reset (engine-ECU).

Code No.B2352 Antenna fail

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

DIAGNOSIS FUNCTION
If an open circuit or short to earth occurs in the key slot, KOS-ECU sets the diagnosis code No. B2352.

JUDGMENT CRITERIA
When the engine switch power supply mode is set from OFF to ON or the driver’s door is opened with the engine switch power supply mode at OFF after the battery-discharged keyless operation key is inserted into the key slot, the KOS-ECU will send a signal to the key slot. Then the key slot will send a code to the keyless operation key via its antenna. If the KOS-ECU detects open circuit or short circuit to earth consecutively four times during the operation above, the ECU will set this diagnosis code.

PROBABLE CAUSES
- Malfunction of the key slot
- Damaged wiring harness and connectors
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Key slot check
Check that the key slot is normal (Refer to Inspection P.42B-100).

Q: Is the check result normal?
YES : Go to Step 2
NO : Replace the key slot.

STEP 2. Check of short to power supply, short to earth, and open circuit in ANTP, ANTG line between the key slot connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the wiring harness.

STEP 3. Check whether the diagnosis code is reset.
(1) Open the driver's door.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : The diagnosis is complete.

Code No.B2400 KOS key registration fail

⚠ CAUTION
- **If the diagnosis code No. B2400 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION
If the registration of the keyless operation key ID to KOS-ECU fails, KOS-ECU sets the diagnosis code No. B2400.

JUDGEMENT CRITERIA
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.

PROBABLE CAUSES
- At the registration, there is an object near the keyless operation key which interferes with the communication.
- Wrong keyless operation key registration method
- Failure of keyless operation key code registration
- Battery drain of keyless operation key
- Malfunction of the keyless operation key
- Malfunction of CAN bus line
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Interference check at keyless operation key registration
At the keyless operation key registration, check if there is another key nearby or anything that interferes with the communication (magnets or objects that generate radio waves such as air-cleaning devices with a power plug).

Q: Are there other keys or anything that interferes with the communication?
YES : Move away or remove other keys or anything that interferes with the communication.
NO : Go to Step 2

STEP 2. Check of keyless operation key registration method
Check that the correct method was used at the registration of keyless operation key.

Q: Is the check result normal?
YES : Go to Step 3
NO : Register the keyless operation key.(Refer to P.42B-88.)

STEP 3. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 4
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting). On completion, go to Step 4.

STEP 4. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 5

STEP 5. Replace the battery in the keyless operation key and recheck the diagnosis code.
Replace the battery of the keyless operation key, which the diagnosis code is stored in, with new one, register the key ID and keyless operation key ID (refer to P.42B-88), and check whether the diagnosis code is stored again.
(1) Turn the power supply mode of the engine switch from OFF to ON.
(2) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Go to Step 6
NO : The diagnosis is complete (Discharged battery).

STEP 6. Replace the keyless operation key and recheck the diagnosis code.
Replace the keyless operation key for which the diagnosis code is set with a new one, register the key ID and keyless operation key ID (refer to P.42B-88), and check whether the diagnosis code is reset again.
(1) Turn the power supply mode of the engine switch from OFF to ON.
(2) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : The diagnosis is complete.

Code No.B2401 Keyless/KOS key ID not registered

⚠ CAUTION
- **If the diagnosis code No. B2401 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION
If no keyless operation key ID is registered with KOS-ECU, KOS-ECU sets the diagnosis code No. B2401.

JUDGMENT CRITERIA
If the number of the registered keyless operation keys or spare key 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 PROCEDURE
1. Register the keyless operation key ID and recheck the diagnosis code.
2. Replace the keyless operation key and recheck the diagnosis code.

Code No.B240A DR side antenna(outdoor) open

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

DIAGNOSTIC FUNCTION
If an open circuit is detected in the outside transmission antenna assembly (driver's side), the diagnosis code is set.

JUDGMENT CRITERIA
While the engine switch is turned to the OFF position, the system has detected an open circuit in the antenna.

PROBABLE CAUSES
- Malfunction of the outside transmission antenna assembly (driver's side)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in EDRP, EDRG line between the outside transmission antenna assembly (driver's side) connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Keyless operation system communication test
Check that the communication with the outside transmission antenna assembly (driver's side) is normal (Refer to Antenna Test P.42B-89).

Antennas to be checked
- Front antenna (outdoor)

OK: Normal is displayed.

Q: Is the check result normal?
YES : Go to Step 3
NO : Replace the outside transmission antenna assembly (driver's side).

STEP 3. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.
(4) Turn the power supply mode of the engine switch from OFF to ON.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).

Code No.B240B PS side antenna(outdoor) open

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

DIAGNOSTIC FUNCTION
If an open circuit is detected in the outside transmission antenna assembly (passenger's side), the diagnosis code is set.

JUDGMENT CRITERIA
While the engine switch is turned to the OFF position, the system has detected an open circuit in the antenna.

PROBABLE CAUSES
- Malfunction of the outside transmission antenna assembly (passenger's side)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in EASP, EASG line between the outside transmission antenna assembly (passenger's side) connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Keyless operation system communication test
Check that the communication with the outside transmission antenna assembly (passenger's side) is normal (Refer to Antenna Test P.42B-89).

Antennas to be checked
- Front side antenna (outdoor)

OK: Normal is displayed.

Q: Is the check result normal?
YES : Go to Step 3
NO : Replace the outside transmission antenna assembly (passenger's side).

STEP 3. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.
(4) Turn the power supply mode of the engine switch from OFF to ON.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).

Code No.B240C Tail gate antenna(outdoor) open

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

DIAGNOSTIC FUNCTION
If an open circuit is detected in the outside transmission antenna assembly (tailgate), the diagnosis code is set.

JUDGMENT CRITERIA

While the engine switch is turned to the OFF position, the system has detected an open circuit in the antenna.

PROBABLE CAUSES

- Malfunction of the outside transmission antenna assembly (tailgate)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in EGTP, EGTG line between the outside transmission antenna assembly (tailgate) connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Keyless operation system communication test

Check that the communication with the outside transmission antenna assembly (tailgate) is normal (Refer to Antenna Test P.42B-89).

Antennas to be checked

- Tailgate antenna (outdoor)

OK: Normal is displayed.

Q: Is the check result normal?
YES : Go to Step 3
NO : Replace the outside transmission antenna assembly (tailgate).

STEP 3. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.
(4) Turn the power supply mode of the engine switch from OFF to ON.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).

Code No.B240D Front antenna(indoor) open

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

DIAGNOSTIC FUNCTION

If an open circuit is detected in the inside transmission antenna (front), the diagnosis code is set.

JUDGMENT CRITERIA

While the engine switch is turned to the OFF position, the system has detected an open circuit in the antenna.

PROBABLE CAUSES

- Malfunction of the inside transmission antenna assembly (front)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in INFP, INFG line between the inside transmission antenna assembly (front) connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Keyless operation system communication test
Check that the communication with the inside transmission antenna assembly (front) is normal (Refer to Antenna Test P.42B-89).

Antennas to be checked
Front antenna (indoor)

OK: Normal is displayed.

Q: Is the check result normal?
YES : Go to Step 3
NO : Replace the inside transmission antenna assembly (front).

STEP 3. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.
(4) Turn the power supply mode of the engine switch from OFF to ON.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).

Code No.B240E RR antenna(indoor) open

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

DIAGNOSTIC FUNCTION
If an open circuit is detected in the inside transmission antenna (rear), the diagnosis code is set.

JUDGMENT CRITERIA
While the engine switch is turned to the OFF position, the system has detected an open circuit in the antenna.

PROBABLE CAUSES
- Malfunction of the inside transmission antenna assembly (rear)
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in INRP, INRG line between the inside transmission antenna assembly (rear) connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Keyless operation system communication test
Check that the communication with the inside transmission antenna assembly (rear) is normal (Refer to Antenna Test P.42B-89).

Antennas to be checked
Rear antenna (indoor)

OK: Normal is displayed.

Q: Is the check result normal?
YES : Go to Step 3
NO : Replace the inside transmission antenna assembly (rear).

STEP 3. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.
(4) Turn the power supply mode of the engine switch from OFF to ON.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).

Code No.B2416 ECU internal error

DIAGNOSIS FUNCTION
KOS-ECU sets diagnosis code No. B2416 when it determines itself to be in abnormal status.

JUDGMENT CRITERIA
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.

PROBABLE CAUSES
Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE
1. Diagnosis code recheck.

Code No.B2417 OSS authentification error

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

DIAGNOSIS FUNCTION
When abnormal data is received from OSS-ECU as a result of the certification communication with OSS-ECU, KOS-ECU sets the diagnosis code No.B2417.

JUDGEMENT CRITERIA
When abnormal data is received from OSS-ECU, KOS-ECU determines that a problem has occurred.

PROBABLE CAUSES
- Malfunction of OSS-ECU (OSS-ECUs have been interchanged between two vehicles.)
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE
1. M.U.T.-III other system diagnosis code.
2. M.U.T.-III diagnosis code.
3. Check whether the diagnosis code is reset.

Code No.B2418 OSS authentification timeout

⚠ CAUTION
- **If the diagnosis code No. B2418 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION
KOS-ECU checks whether the OSS-ECU data is received via CAN bus line, and it sets the diagnosis code No.B2418 if the data cannot be received.

JUDGEMENT CRITERIA
If the reception of data from OSS-ECU received via CAN bus line (OSS-ECU sends data to KOS-ECU via CAN bus line) is not possible, KOS-ECU determines that a problem has occurred.

PROBABLE CAUSES
- Malfunction of CAN bus line
- Malfunction of OSS-ECU
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE
1. M.U.T.-III CAN bus diagnostics
2. M.U.T.-III other system diagnosis code
3. Check whether the diagnosis code is reset.

Code No.B2419 LF antenna voltage short

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

DIAGNOSTIC FUNCTION

When a short to power supply is detected in the wiring harness in between the inside and outside transmission antenna assembly, KOS-ECU sets the diagnosis code No.B2419.

NOTE: When the diagnosis code No.B2419 is set, KOS-ECU does not perform the certification with the keyless operation key.

JUDGMENT CRITERIA

When an abnormality is found with the wiring harness in between the inside and outside transmission antenna assembly, KOS-ECU determines that a problem has occurred.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

STEP 1. Check the wiring harness between KOS-ECU connector and each inside and outside transmission antenna assembly connector.

Check the following wiring harnesses for short to power supply.

- Check of short to power supply, short to earth, and open circuit in EDRP, EDRG line between KOS-ECU connector and outside transmission antenna assembly (driver's side) connector
- Check of short to power supply, short to earth, and open circuit in EASP, EASG line between KOS-ECU connector and outside transmission antenna assembly (passenger's side) connector
- Check of short to power supply, short to earth, and open circuit in INFP, INFG line between KOS-ECU connector and inside transmission antenna assembly (front) connector
- Check of short to power supply, short to earth, and open circuit in INRP, INRG line between KOS-ECU connector and inside transmission antenna assembly (rear) connector
- Check of short to power supply, short to earth, and open circuit in EGTP, EGTG line between KOS-ECU connector and outside transmission antenna assembly (tailgate) connector

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : The diagnosis is complete.

Code No.B241A ESL power control circuit earth
Code No.B241B ESL power control circuit open

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

DIAGNOSIS FUNCTION

B241A
- When a short to earth occurs in the wiring harness between the electrical steering lock and KOS-ECU, KOS-ECU sets the diagnosis code No.B241A.

B241B
- When an open circuit or short to power supply occurs in the wiring harness between the electrical steering lock and KOS-ECU, KOS-ECU sets the diagnosis code No.B241B.

JUDGEMENT CRITERIA

B241A
- When a short to earth occurs in the wiring harness, KOS-ECU determines that a problem has occurred.

B241B
- When an open circuit or short to power supply occurs in the wiring harness, KOS-ECU determines that a problem has occurred.

PROBABLE CAUSES
- Malfunction of the electronic steering lock
- Malfunction of the KOS-ECU
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in PCK line between the electronic steering lock connector and the KOS-ECU connector, between the OSS-ECU connector and the KOS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connectors or wiring harness.

STEP 2. Voltage measurement at electronic steering lock connector (PCK line)
(1) Disconnect the connector, and measure the voltage at the wiring harness-side connector.
(2) Open the driver's door.
(3) Measure the voltage at the electronic steering lock connector (PCK line) and the body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 3
NO : Replace the electronic steering lock. Go to Step 3.

STEP 3. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.U0141 ETACS CAN timeout

⚠ CAUTION
- **If the diagnosis code No. U0141 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION

If no signal from ETACS can be received, KOS-ECU sets the diagnosis code No. U0141.

PROBABLE CAUSES
- Malfunction of CAN bus line
- Malfunction of KOS-ECU

- Malfunction of ETACS-ECU

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III other system diagnosis code
Check if any diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Perform troubleshooting for ETACS (Refer to GROUP 54A – ETACS – Troubleshooting).
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check if diagnosis code No.U0141 is set to the combination meter.

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set to the KOS-ECU.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to cope with Intermittent Malfunction).

Code No.U0155 Meter CAN timeout

⚠ CAUTION
- **If the diagnosis 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.**

DIAGNOSIS FUNCTION
If no signal from the combination meter can be received, KOS-ECU sets the diagnosis code No. U0155.

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

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III other system diagnosis code
Check if any diagnosis code is set to the combination meter.

Q: Is the diagnosis code set?
YES : Perform troubleshooting for the combination meter (Refer to GROUP 54A – Combination Meter – Troubleshooting).
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check if diagnosis code No.U0155 is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set to the KOS-ECU.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. U0164: A/C-ECU CAN timeout

⚠ CAUTION
- **If diagnosis code No. U0164 is set, be sure to diagnose the CAN bus line.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION
If the signal from A/C-ECU cannot be received, the KOS-ECU sets diagnosis code No. U0164.

PROBABLE CAUSES
- Malfunction of CAN bus line
- Malfunction of A/C-ECU
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III other system diagnosis code
Check if the A/C-ECU related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the A/C or heater (GROUP 55, Auto A/C Diagnosis).
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check if diagnosis code No.U0164 is set to the combination meter.

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set to the KOS-ECU.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the A/C-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. U0230: Electric tailgate control unit CAN timeout

⚠ CAUTION
- **If the diagnosis code No. U0230 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 the electric tailgate control unit can be received, KOS-ECU sets the diagnosis code No. U0230.

PROBABLE CAUSES

- Malfunction of CAN bus line
- Malfunction of the electric tailgate control unit
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnostics
2. Check the M.U.T.-III Diagnosis code for other systems

   Check that a diagnosis code is set in the electric tailgate control unit.
3. Diagnosis code recheck

Code No. U0245 AND CAN timeout

⚠ CAUTION
- **If diagnosis code No. U0245 is set, be sure to diagnose the CAN bus line.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signal from the CAN box unit (MMCS) cannot be received, KOS-ECU sets the diagnosis code No.U0245.

JUDGEMENT CRITERIA

Check Conditions
- When all the following conditions are met.
  a. Ignition switch: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion
- After the following condition is met, 2,500 ms or more have elapsed.
  a. CAN signal from MMCS cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- CAN box unit malfunction
- Malfunction of MMCS power supply circuit
- MMCS malfunction
- Error in option coding setting of ETACS-ECU (replacement with the navigation unit not compatible with CAN communication)
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. Check of ETACS-ECU option coding
3. ETACS-ECU diagnosis code check
4. KOS-ECU diagnosis code recheck

Code No.U1000 OSS CAN timeout

⚠ CAUTION
- **If the diagnosis code No. U1000 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSIS FUNCTION
When the signal from OSS-ECU cannot be received, KOS-ECU sets the diagnosis code No.U1000.

PROBABLE CAUSES
- Malfunction of CAN bus line
- Malfunction of OSS-ECU
- Malfunction of KOS-ECU

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting). On completion, go to Step 2.

STEP 2. Check the M.U.T.-III Diagnosis code for other systems
Check that the OSS-ECU set a diagnosis code.

Q: Is the diagnosis code set?
YES : Diagnose the OSS-ECU. Refer to Troubleshooting .
NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code
Check if diagnosis code No.U1000 is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Turn the power supply mode of the engine switch from OFF to ON.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. U1190: No receive fault detect signal

⚠ CAUTION
- **If the diagnosis code No. U1190 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the signal from the ETACS-ECU cannot be received, KOS-ECU sets the diagnosis code No.U1190.

JUDGEMENT CRITERIA

Check Conditions
- When all the following conditions are met.
  a. Power supply mode: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion
- After the following condition is met, 5,000 ms or more have elapsed.

a. CAN signal from the ETACS-ECU cannot be received.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III other system diagnosis code
Check again if the diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS-ECU (Refer to GROUP 54A, Troubleshooting).
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check again if the diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU.
NO : Go to Step 4.

STEP 4. Diagnosis code recheck
Check again if the diagnosis code is set to the KOS-ECU.
(1) Erase the diagnosis code.
(2) Turn the engine switch from the LOCK (OFF) position to the ON position.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the KOS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to cope with Intermittent Malfunction).

Code No. U1195 Coding not completed

⚠ CAUTION
- **If diagnosis code No. U1195 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the coding data is not registered, KOS-ECU sets the diagnosis code No.U1195.

JUDGEMENT CRITERIA

Check Conditions
- When all the following conditions are met.
  a. Coding is not completed.
  b. For 5 seconds since the start of the reception of ignition status signal (ON or during cranking) transmitted from ETACS-ECU.

Judgment Criterion
- Any of the coding is not completed normally.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Variant coding for ETACS-ECU has not been implemented.
- Malfunction of KOS-ECU
- ETACS-ECU malfunction

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. ETACS-ECU diagnosis code check
3. KOS-ECU diagnosis code recheck

DATA LIST REFERENCE TABLE

M1429605000329

Item No.	Check item	Check condition	Normal condition
1*	Received KOS key data(ID)	–	Memorised keyless operation key ID
2	Received KOS key data(button)	–	Switch display of the keyless operation key

Item No.	Check item	Check condition	Normal condition
3	Driver's door lock/unlock SW	Driver's door lock/unlock switch: ON	ON
		Driver's door lock/unlock switch: OFF	OFF
5	Passenger's door lock/unlock SW	Passenger's door lock/unlock switch: ON	ON
		Passenger's door lock/unlock switch: OFF	OFF
7	Tail gate lock SW	Tailgate lock release handle lock switch: ON	ON
		Tailgate lock release handle lock switch: OFF	OFF
8	Tail gate unlock SW	Tailgate lock release handle (open switch): ON	ON
		Tailgate lock release handle (open switch): OFF	OFF
14	Memorized KOS keys	–	Number of the keyless operation keys memorised
15*	Memorized emergency KOS keys	–	Number of the emergency keys memorised

*NOTE: * shows that it is displayed but not used.*

ACTUATOR TEST TABLE

M1429605100081

Item No.	Check item	Driven component
1	Outer buzzer	Forces to sound the outer buzzer.

TROUBLE SYMPTOM CHART

M1429604501056

Trouble symptom	Inspection procedure number	Reference page
Cannot communicate with KOS-ECU using the M.U.T.-III.	1	P.42B-34
The keyless operation key cannot be registered using the M.U.T.-III.	2	P.42B-34
Abnormality in KOS-ECU power supply and earth circuits.	3	P.42B-35
Keyless operation warning display does not disappear.	4	P.42B-36
No door will be locked or unlocked by operating a lock/unlock switch on any door.	5	P.42B-37
Driver's door lock/unlock switch does not work.	6	P.42B-38
Front passenger's door lock/unlock switch does not work.	7	P.42B-38
The lock switch and open switch of the tailgate lock release handle do not work.	8	P.42B-39
The lock switch of the tailgate lock release handle does not perform the locking operation.	9	P.42B-40
The open switch of the tailgate lock release handle does not perform the unlocking operation.	10	P.42B-41
Keyless entry function does not work.	11	P.42B-42
KOS timer lock function does not work.	12	P.42B-43

Trouble symptom	Inspection procedure number	Reference page
Keyless entry hazard answerback function or the room lamp answerback function does not work normally.	13	P.42B-44
Multimode keyless entry function does not work at all.	14	P.42B-45
Outer buzzer does not sound.	15	P.42B-45
Power door locks with selective unlocking does not work.	16	P.42B-46

SYMPTOM PROCEDURES

Inspection Procedure 1: Cannot communicate with KOS-ECU using the M.U.T.-III.

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

COMMENTS ON TROUBLE SYMPTOM
KOS-ECU is communicating with M.U.T.-III via CAN. Therefore, communication error of KOS-ECU is suspected.

PROBABLE CAUSES
- Malfunction of the power supply and the earth of KOS-ECU
- Malfunction of CAN bus line

DIAGNOSIS PROCEDURE
1. M.U.T.-III CAN bus diagnostics.
2. Check the power supply circuit and the earth circuit to KOS-ECU.

   Refer to Inspection Procedure 3 "Abnormality in KOS-ECU power supply and earth circuits" P.42B-35.
3. Retest the system.

Inspection Procedure 2: The keyless operation key cannot be registered using the M.U.T.-III.

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

COMMENTS ON TROUBLE SYMPTOM
If only some keyless operation keys cannot be registered, the keyless operation key itself may be faulty. If no keyless operation key can be registered, the key assembly may have already been registered for another vehicle, or the KOS-ECU may be faulty.

PROBABLE CAUSES
- Insufficient insertion of keyless operation key into key slot
- CAN communication error with OSS-ECU
- OSS-ECU key code not registered
- Malfunction of the keyless operation key
- Malfunction of KOS-ECU
- Keyless operation key already registered to another vehicle

DIAGNOSIS PROCEDURE

STEP 1. Sufficiently insert the keyless operation key into the key slot, and then check the trouble symptom.
Insert the keyless operation key into the key slot again, and check whether the keyless operation key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 2

STEP 2. Interference check of keyless operation key when it is inserted in the key slot

Check if there is another keyless operation key nearby or anything that interferes with the communication (magnets or objects that generate radio waves such as air-cleaning devices with a power plug).

Q: Are there other keys or anything that interferes with the communication?
YES : Move away or remove other keyless operation keys or anything that interferes with the communication. Then, go to Step 3.
NO : Go to Step 4

STEP 3. Retest the system

Check that the keyless operation key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 4

STEP 4. M.U.T.-III diagnosis code

Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Perform troubleshooting for the KOS-ECU (Refer to troubleshooting P.42B-11).
NO : Go to Step 5

STEP 5. M.U.T.-III other system diagnosis code

Check if any diagnosis code is set to the OSS-ECU.

Q: Is the diagnosis code set?
YES : Perform troubleshooting for the OSS-ECU (Refer to troubleshooting P.42B-53).
NO : Go to Step 6

STEP 6. Check which keyless operation key cannot be registered.

Q: Can any one of the keyless operation keys be registered?
YES (Only some keys) : Replace the key that cannot be registered and register the ID codes (Refer to P.42B-88). After registering the ID codes, go to Step 8.
NO (All keys) : Go to Step 7

STEP 7. Retest the system

Check the M.U.T.-III screen when the key was not able to be registered.

Q: Is the error message of M.U.T.-III screen "Abnormality in key"?
YES (Abnormality in key) : Carry out diagnosis code B1A25: Key ID unmatched (Refer to P.42B-11). Then, go to Step 8.
NO (ECU internal error) : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

STEP 8. Retest the system

Check that the keyless operation key can be registered.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Go to Step 9

STEP 9. Check whether the diagnosis code is reset.

(1) Turn the power supply mode of the engine switch from OFF to ON.
(2) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).
NO : The procedure is complete.

Inspection Procedure 3: Abnormality in KOS-ECU power supply and earth circuits.

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

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

STEP 1. Resistance measurement at KOS-ECU connector (GND terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the KOS-ECU

connector (GND terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Check of open circuit in GND line between KOS-ECU connector and body earth

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).
NO : Repair the connector(s) or wiring harness.

STEP 3. Voltage measurement at KOS-ECU connector (IG1 terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Check the voltage between the KOS-ECU connector (IG1 terminal) and body earth.

OK: System voltage

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

STEP 4. Check of short to power supply, short to earth, and open circuit in IG1 line between ETACS-ECU connector and KOS-ECU connector

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).
NO : Repair the connector(s) or wiring harness.

STEP 5. Voltage measurement at KOS-ECU connector (PWR terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Check the voltage between the KOS-ECU connector (PWR terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Replace the KOS-ECU and register the chassis number (Refer to P.42B-93).
NO : Go to Step 6.

STEP 6. Check of short to power supply, short to earth, and open circuit in PWR line between fusible link (4) and KOS-ECU connector

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).
NO : Repair the connector(s) or wiring harness.

Inspection Procedure 4: Keyless operation warning display does not disappear.

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

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting). On completion, go to Step 2.

STEP 2. M.U.T.-III other system diagnosis code
Check if any diagnosis code is set to the combination meter.

Q: Is the diagnosis code set?
YES : Perform troubleshooting for the combination meter (Refer to GROUP 54A – Combination Meter – Troubleshooting).
NO : Go to Step 3.

STEP 3. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to P.42B-11.
NO : Go to Step 4.

STEP 4. Retest the system
Check that the keyless operation warning lamp turns OFF unless the flashing or illumination 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 Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 5: No door will be locked or unlocked by operating a lock/unlock switch on any door.

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

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
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 42A – Troubleshooting).

STEP 4. Check the customisation
Check that "KOS feature" is set to "Both enable" with a customisation function.

Q: Is it set to "Both enable"?
YES : Go to Step 5.
NO : Set "KOS feature" to "Both enable" with a customisation function (Refer to P.42B-90).

STEP 5. Check with another registered keyless operation key.

Q: Can the engine switch be turned ON? (Is the keyless operation key recognised?)
YES : Replace the keyless operation key that could not turn the engine switch ON (the keyless operation key was not recognised), and register the ID codes (refer to P.42B-88).
NO : Go to Step 6.

STEP 6. Check of the troubles
Operate the lock/unlock switch to check that the door can be locked and unlocked.

Q: Is the check result normal?
YES : The diagnosis is complete.
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 6: Driver's door lock/unlock switch does not work.

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

PROBABLE CAUSES

- Malfunction of the outside transmission antenna assembly (driver's side)
- Malfunction of the lock/unlock switch (driver's side)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 2.

STEP 2. Lock/unlock switch (LH) check
Check that the lock/unlock switch (LH) is normal (Refer to GROUP 42A – Inspection).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the lock/unlock switch (LH).

STEP 3. Resistance measurement at lock/unlock switch (LH) connector (earth line)
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the lock/unlock switch (LH) connector (earth line) and body earth.

OK: Continuity exists (2 Ω or less)

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

STEP 4. Check of open circuit in earth line between the lock/unlock switch (LH) connector and the body earth.
NOTE: Before the wiring harness check, check the intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 5. Check of short to power supply, short to earth, and open circuit in DRRQ line between the KOS-ECU connector and the lock/unlock switch (LH) connector.
NOTE: Before the wiring harness check, check the intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. KOS communication test
Using M.U.T-III, perform the antenna communication test to check that the outside transmission antenna assembly (driver's side) communicates normally (Refer to P.42B-89).

Q: Is the check result normal?
YES : Go to Step 7.
NO : Perform troubleshooting for the diagnosis code No. B240A (Refer to P.42B-11).

STEP 7. Check of the troubles
Operate the lock/unlock switch (LH) and check that the doors can be locked and unlocked.

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 7: Front passenger's door lock/unlock switch does not work.

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

PROBABLE CAUSES

- Malfunction of the outside transmission antenna assembly (passenger's side)

- Malfunction of the lock/unlock switch (passenger's side)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 2.

STEP 2. lock/unlock switch (RH) check
Check that the lock/unlock switch (RH) is normal (Refer to GROUP 42A – Door Handle and Latch).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the lock/unlock switch (RH).

STEP 3. Resistance measurement at lock/unlock switch (RH) connector (earth line)
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the lock/unlock switch (RH) connector (earth line) and body earth.

OK: Continuity exists (2 Ω or less)

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

STEP 4. Check of open circuit in earth line between the lock/unlock switch (RH) connector and the body earth.

NOTE: Before the wiring harness check, check the intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 5. Check of short to power supply, short to earth, and open circuit in ASRQ line between the KOS-ECU connector and the lock/unlock switch (RH) connector.

NOTE: Before the wiring harness check, check the intermediate connectors, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. KOS communication test
Using M.U.T.-III, perform the antenna communication test to check that the outside transmission antenna assembly (passenger's side) communicates normally (Refer to P.42B-89).

Q: Is the check result normal?
YES : Go to Step 7.
NO : Perform troubleshooting for the diagnosis code No. B240B (Refer to P.42B-11).

STEP 7. Check of the troubles
Operate the lock/unlock switch (RH) to check that the doors can be locked and unlocked.

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 8: The lock switch and open switch of the tailgate lock release handle do not work.

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

PROBABLE CAUSES

- Malfunction of the outside transmission antenna assembly (tailgate)
- Malfunction of the tailgate lock release handle
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 2.

STEP 2. Tailgate lock release handle (lock switch and open switch) check
Check that the tailgate lock release handle (lock switch and open switch) is normal (Refer to GROUP 42A – Tailgate Handle and Latch <Vehicles without electric tailgate> or <Vehicles with electric tailgate>).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the tailgate lock release handle.

STEP 3. Check of open circuit in earth line between the tailgate lock release handle connector and the body earth.
NOTE: Before the wiring harness check, check the intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. KOS communication test
Using M.U.T-III, perform the antenna communication test to check that the outside transmission antenna assembly (tailgate) communicates normally (Refer to P.42B-89).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Perform troubleshooting for the diagnosis code No. B240C (Refer to P.42B-11).

STEP 5. Check of the troubles
Operate the tailgate lock release handle and check that the tailgate can be locked and opened.

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 9: The lock switch of the tailgate lock release handle does not perform the locking operation.

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

PROBABLE CAUSES

- Malfunction of the outside transmission antenna assembly (tailgate)
- Malfunction of the tailgate lock release handle (lock switch)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 2.

STEP 2. Tailgate lock release handle (lock switch) check
Check that the tailgate lock release handle (lock switch) is normal (Refer to GROUP 42A – Tailgate Handle and Latch <Vehicles without electric tailgate> or <Vehicles with electric tailgate>).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the tailgate lock release handle.

STEP 3. Check of short to power supply, short to earth, and open circuit in GTRQ line between the KOS-ECU connector and the tailgate lock release handle connector.
NOTE: Before the wiring harness check, check the intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. KOS communication test
Using M.U.T-III, perform the antenna communication test to check that the outside transmission antenna assembly (tailgate) communicates normally (Refer to P.42B-89).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Perform troubleshooting for the diagnosis code No. B240C (Refer to P.42B-11).

STEP 5. Check of the troubles
Operate the tailgate lock release handle (lock switch) to check that the tailgate 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 Deal with Intermittent Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 10: The open switch of the tailgate lock release handle does not perform the unlocking operation..

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

PROBABLE CAUSES

- Malfunction of the outside transmission antenna assembly (tailgate)
- Malfunction of the tailgate lock release handle (open switch)
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 2.

STEP 2. Tailgate lock release handle (open switch) check
Check that the tailgate lock release handle (open switch) is normal (Refer to GROUP 42A – Tailgate Handle and Latch <Vehicles without electric tailgate> or <Vehicles with electric tailgate>).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the tailgate lock release handle.

STEP 3. Check of short to power supply, short to earth, and open circuit in GTOP line between the KOS-ECU connector and the tailgate lock release handle connector.
NOTE: Before the wiring harness check, check the intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness.

STEP 4. KOS communication test
Using M.U.T-III, perform the antenna communication test to check that the outside transmission antenna assembly (tailgate) communicates normally (Refer to P.42B-89).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Perform troubleshooting for the diagnosis code No. B240C (Refer to P.42B-11).

STEP 5. Check of the troubles
Operate the tailgate lock release handle (open switch) to check that the tailgate can be opened.

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Deal with Intermittent Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 11: Keyless entry function does not work.

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

OPERATION

The lock/unlock signal of the keyless operation key is sent to ETACS-ECU via KOS-ECU. Also, when ETACS receives signals from the all the door switches, ETACS-ECU judges them to activate the keyless entry function.

PROBABLE CAUSES

- Malfunction of CAN bus line
- Malfunction of the door switches
- Malfunction of the keyless operation key
- Damaged wiring harness and connectors
- Malfunction of the KOS-ECU
- Malfunction of ETACS-ECU

DIAGNOSIS PROCEDURE

STEP 1. ETACS-ECU coding data check

(1) Use M.U.T.-III to read out the option coding information in ETACS-ECU (Refer to GROUP 00 – Precautions before Service - Coding Reference Table).
(2) Check if the "Keyless function" is "Enabled."

Q: Is the check result normal?
YES : Go to Step 2
NO : Operate the M.U.T.-III to set the option coding "keyless" to "enabled," and check the trouble symptom.

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

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

Q: Is the CAN bus normal?
YES : Go to Step 3
NO : Repair the CAN bus line. (Refer to GROUP 54C – Troubleshooting .)

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

Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart .
NO : Go to Step 4

STEP 4. Check the power supply system

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

- Hazard warning lamp

Q: Is the check result normal?
YES : Go to Step 5
NO : Refer to GROUP 54A – Abnormality in ETACS-ECU Power Supply Circuit .

STEP 5. Check the operation of the central door locking system.

Check that the central door locking system works normally.

Q: Is the check result normal?
YES : Go to Step 6
NO : Refer to GROUP 42A – Troubleshooting .

STEP 6. M.U.T.-III data list

Check the ETACS-ECU service data relevant to the operation of keyless entry function.

- Turn the power supply mode of engine switch to OFF.
- Close the driver's door.
- Close the front passenger's doors.
- Close the RH-side rear door.
- Close the LH-side rear door.
- Close the tailgate.

Item No.	Item name	Normal condition
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

OK: Normal conditions are displayed for all the items.

Q: Are the check result normal?

Normal conditions are displayed for all the items. : Go to Step 7.
Normal condition is not displayed for item No. 256. : Refer to GROUP 54A – Inspection Procedure 5: "Front door switch (driver's side) signal is not received ."
Normal condition is not displayed for item No. 257. : Refer to GROUP 54A – Inspection Procedure 6: "Front door switch (passenger's side) signal is not received ."
Normal condition is not displayed for item No. 258. : Refer to GROUP 54A – Inspection Procedure 7: "Rear door switch (RH) signal is not received ."
Normal condition is not displayed for item No. 259. : Refer to GROUP 54A – Inspection Procedure 8: Rear door switch (LH) signal is not received .
Normal condition is not displayed for item No. 260. : Refer to GROUP 54A – Inspection Procedure 9: "Tailgate latch signal is not received ."

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-88).
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 function 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).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 12: KOS timer lock function does not work.

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

OPERATION

After the door is unlocked using the keyless entry function or the door entry function, if no operation is performed, the door is locked when the time specified by a customisation function has elapsed. However, when an open signal of any of the doors is received by ETACS-ECU or when the engine switch power supply mode is ON, the KOS timer lock function will not be activated.

PROBABLE CAUSES

- Malfunction of ETACS-ECU
- Malfunction of the door switches

DIAGNOSIS PROCEDURE

STEP 1. Check the keyless entry function operation
Check that the keyless entry function operation normally.

Q: Is the check result normal?
YES : Go to Step 2
NO : Refer to Inspection Procedure 11: "Keyless entry function does not work P.42B-42."

STEP 2. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 3.

STEP 3. Check of the troubles
Check that the KOS timer lock function operates.

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points).
NO : Perform troubleshooting for each door switch (Refer to GROUP 54A – ETACS – Troubleshooting).

Inspection Procedure 13: Keyless entry hazard answerback function or the room lamp answerback function does not work normally.

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

OPERATION

When the keyless entry function is used, the keyless entry hazard answerback function or room lamp answerback function operate as set by ETACS customisation function (If the flashing count is set to 0 with a customisation function, no answerback function is performed).

PROBABLE CAUSES

- Function setting error or no setting with a customisation
- Malfunction of the turn signal lamp
- Malfunction of the room lamp
- Malfunction of ETACS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check the hazard warning lamp

Check that the hazard warning lamp illuminate normally.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to GROUP 54A – Inspection Procedure 1: "The hazard warning lamps do not illuminate ."

STEP 2. Check the room lamps operation

Check that the room lamps illuminate normally.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to GROUP 54A, The front room lamp does not illuminate normally .

STEP 3. Check the keyless entry system operation

Check that the keyless entry system operation normally.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Refer to Inspection Procedure 9: "Keyless entry system does not work P.42B-42."

STEP 4. Check the customisation

Check that any one of the followings other than "Lock: 0, Unlock: 0" is set for "Hazard answerback" with a customisation function.

- Lock:1, Unlock:2
- Lock:1, Unlock:0
- Lock:0, Unlock:2
- Lock:2, Unlock:1
- Lock:0, Unlock:1
- Lock:2, Unlock:0

NOTE: If "Lock: 0" or "Unlock: 0" is selected, no answerback function is performed on locking or unlocking.

Q: Is it set to other than "Lock: 0, Unlock: 0"?
YES : Go to Step 5.
NO : Set "Hazard answerback" to any one other than "Lock: 0, Unlock: 0" with a customisation function (Refer to P.42B-90).

STEP 5. M.U.T.-III diagnosis code

Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to P.42B-11.
NO : Go to Step 6.

STEP 6. Check of the troubles

Check that the hazard answerback and room lamp answerback functions of the keyless entry operate.

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 .)
NO : Replace ETACS-ECU. After the replacement, perform the coding.

Inspection Procedure 14: Multimode keyless entry function does not work at all.

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

OPERATION
With a ETACS customisation function, using the keyless operation key, the electric-folding door mirrors <Vehicles with electric retractable remote controlled door mirrors> can be activated.

PROBABLE CAUSES
- Malfunction of the keyless operation key
- Function setting error or no setting with a customisation
- Malfunction of ETACS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check the keyless entry function operation.
Check that the keyless entry system works normally.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to inspection procedure 11 "keyless entry function does not work P.42B-42."

STEP 2. Check the operation of the electric-folding door mirror.
Check that the electric folding door mirrors work normally.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to GROUP 51 – Troubleshooting .

STEP 3. Check the customisation
Use the customisation function to check that the "Multi mode" has been set to other than "Disabled."
Vehicles with electric retractable remote controlled door mirrors
- D/M: O and C.

Q: Is it set to other than "disabled"?
YES : Go to Step 4.
NO : Use the customisation function to set the "Multi mode" to other than "Disabled" (Refer to P.42B-90).

STEP 4. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 5.

STEP 5. Check of the troubles
Check that the multimode keyless entry function works 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 Deal with Intermittent Malfunction).
NO : Replace ETACS-ECU. After the replacement, perform the coding.

Inspection Procedure 15: Outer buzzer does not sound.

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

OPERATION
The outer buzzer 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 customisation function, "Buzzer answerback" may be set to "Not Sound Buzzer."

PROBABLE CAUSES
- Malfunction of the outer buzzer
- Malfunction of the KOS-ECU
- Malfunction of the connector
- Function setting error or no setting with a customisation

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if any diagnosis code is set to the KOS-ECU.

Q: Is the diagnosis code set?
YES : Refer to diagnosis code chart P.42B-11.
NO : Go to Step 2.

STEP 2. Check the customisation
With a customisation function, check if "Buzzer answerback" is set to other than "Not Sound Buzzer."

Q: Is it set to other than "Not Sound Buzzer"?
YES : Go to Step 3.
NO : With a customisation function, "Buzzer answerback" is set to other than "Not Sound Buzzer" (Refer to P.42B-90).

STEP 3. M.U.T.-III actuator test
Check that the outer buzzer sounds (Refer to P.42B-33).

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

STEP 4. Check of short to power supply, short to earth, and open circuit in DRVB, PWRB line between the KOS-ECU connector and the outer buzzer connector.
NOTE: Before the wiring harness check, check the intermediate connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the wiring harness.

STEP 5. Check of the troubles
Check that the outer buzzer sounds when the outer buzzer 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 Deal with Intermittent Malfunction).
NO : Replace KOS-ECU and register the ID codes (Refer to P.42B-88).

Inspection Procedure 15: Power door locks with selective unlocking does not work.

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

COMMENT ON TROUBLE SYMPTOM

When the keyless entry function and door entry function operate normally, but there is an error to only the power door locks with selective unlocking, ETACS-ECU may have a problem. In addition, it is possible that the function has been set to "all doors unlock" by the customisation function.

PROBABLE CAUSES

- Malfunction of ETACS-ECU
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. Check the customisation

Q: Are the power door locks with selective unlocking enabled by the customisation function?
YES : Go to Step 2
NO : Set the power door locks with selective unlocking to "Enabled" by using the customisation function. Refer to P.42B-90.

STEP 2. Power door locks with selective unlocking operation check
Check that the power door locks with selective unlocking operate normally by means of the keyless entry function or door entry function.

Q: Is the check result normal?
YES : Go to Step 5
NO (Does not work by means of keyless entry function) : Go to Step 3
NO (Does not work by means of door entry function) : Go to Step 4
NO (Does not work by means of either functions) : Go to Step 5

STEP 3. Keyless entry system operation check

Press the unlock switch of the keyless operation key and check that only the driver's door is unlocked. Then, press the unlock switch once again within 2 seconds after that to check that the front passenger's door, rear doors, and tailgate are unlocked.

Q: Does the keyless entry function work normally?

YES : Go to Step 5

NO (Only the driver's door is not unlocked.) : Replace ETACS-ECU.

NO (The driver's door, front passenger's door, rear doors, and tailgate are not unlocked.) : Refer to Inspection Procedure 8: "Keyless entry function does not work P.42B-42."

STEP 4. Door entry function operation check

Press the lock/unlock switch (driver's side) and check that only the driver's door is unlocked. Then, press the lock/unlock switch (driver's side) once again within 2 seconds after that to check that the front passenger's door, rear doors, and tailgate are unlocked.

Q: Does the door entry function work normally?

YES : Go to Step 5

NO (Only the driver's door is not unlocked.) : Replace ETACS-ECU.

NO (The driver's door, front passenger's door, rear doors, and tailgate are not unlocked.) : Refer to Inspection Procedure 6: "Driver's door lock/unlock switch does not work P.42B-38."

STEP 5. Check of the troubles

Check that the power door locks with selective unlocking works normally.

Q: Is the check result normal?

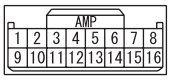
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

NO : Replace ETACS-ECU.

TERMINAL VOLTAGE REFERENCE CHART

M1429606800704

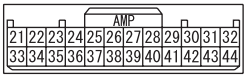
KOS-ECU TERMINAL CHECK



AC905451

Terminal number	Terminal code	Check item	Check condition	Normal condition
1	ANTP	Immobilizer antenna output (+)	When communicating with the keyless operation key (discharged battery) in the key slot	0 to 5 V (pulse signal)
2	CANL	CAN L	–	–
3	CANH	CAN H	–	–
4	GND	Earth	Always	1 V or less
5	PWRB	Output to buzzer (+)	Buzzer is sounding	10 to 12 V (pulse signal)
6	–	–	–	–
7	IG1	Power supply from ignition switch (IG1)	Ignition switch: ON	System voltage
8	PWR	Battery power supply	Always	System voltage

Terminal number	Terminal code	Check item	Check condition	Normal condition
9	ANTG	Immobilizer antenna output (-)	When communicating with the keyless operation key (discharged battery) in the key slot	0 to 5 V (pulse signal)
10,	–	–	–	–
11	GTOP	Tailgate lock release handle output	Open switch of tailgate lock release handle: ON	1 V or less
12, 13	–	–	–	–
14	GTRQ	Tailgate lock release handle output	Lock switch of tailgate lock release handle: ON	1 V or less
15	ASRQ	Lock/unlock switch (passenger's side) output	Lock/unlock switch: ON	1 V or less
16	DRRQ	Lock/unlock switch (driver's side) output	Lock/unlock switch: ON	1 V or less



AC905452

Terminal number	Terminal code	Check item	Check condition	Normal condition
21	BKOS	Power supply	While the power supply fuse (IOD fuse) is removed, when the engine switch is pressed from the engine switch power supply mode OFF	System voltage
22		–	–	–
23	PCK	Output of electric steering lock driving permission signal	• KOS-ECU active • Engine stopped	System voltage
24 – 27		–	–	–
28	EGTP	Outside transmission antenna assembly (tailgate) power supply	• At the door switch operation • At the engine switch operation • At door open/close	0 to 8 V (pulse signal)
29	INRP	Inside transmission antenna assembly (rear) power supply	• At the door switch operation • At the engine switch operation • At door open/close	0 to 8 V (pulse signal)
30	EASP	Outside transmission antenna assembly (passenger's side) power supply	• At the door switch operation • At the engine switch operation • At door open/close	0 to 8 V (pulse signal)

Terminal number	Terminal code	Check item	Check condition	Normal condition
31	INFP	Inside transmission antenna assembly (front) power supply	• At the door switch operation • At the engine switch operation • At door open/close	0 to 8 V (pulse signal)
32	EDRP	Outside transmission antenna assembly (driver's side) power supply	• At the door switch operation • At the engine switch operation • At door open/close	0 to 8 V (pulse signal)
33	DRVP	Output to buzzer (-)	Buzzer is sounding	0 to 10 V (pulse signal)
34 – 39		–	–	–
40	EGTG	Outside transmission antenna assembly (tailgate) earth	Always	1 V or less
41	INRG	Inside transmission antenna assembly (rear) earth	Always	1 V or less
42	EASG	Outside transmission antenna assembly (passenger's side) earth	Always	1 V or less
43	INFG	Inside transmission antenna assembly (front) earth	Always	1 V or less
44	EDRG	Outside transmission antenna assembly (driver's side) earth	Always	1 V or less

TROUBLESHOOTING <OSS-ECU>

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1429604400119

Refer to GROUP 00 – Contents of troubleshooting .

DIAGNOSIS FUNCTION

M1429605400305

HOW TO READ DIAGNOSIS CODE

Refer to GROUP 00 – Diagnosis function .

HOW TO ERASE DIAGNOSIS CODE

Refer to GROUP 00 – Diagnosis function .

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using the M.U.T.-III.

When detecting fault and storing the diagnosis code, the ECU connected to CAN bus line obtains the data before the determination of the diagnosis code and the data when the diagnosis code is determined, and then stores the ECU status of that time. By analysing each data from M.U.T.-III, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

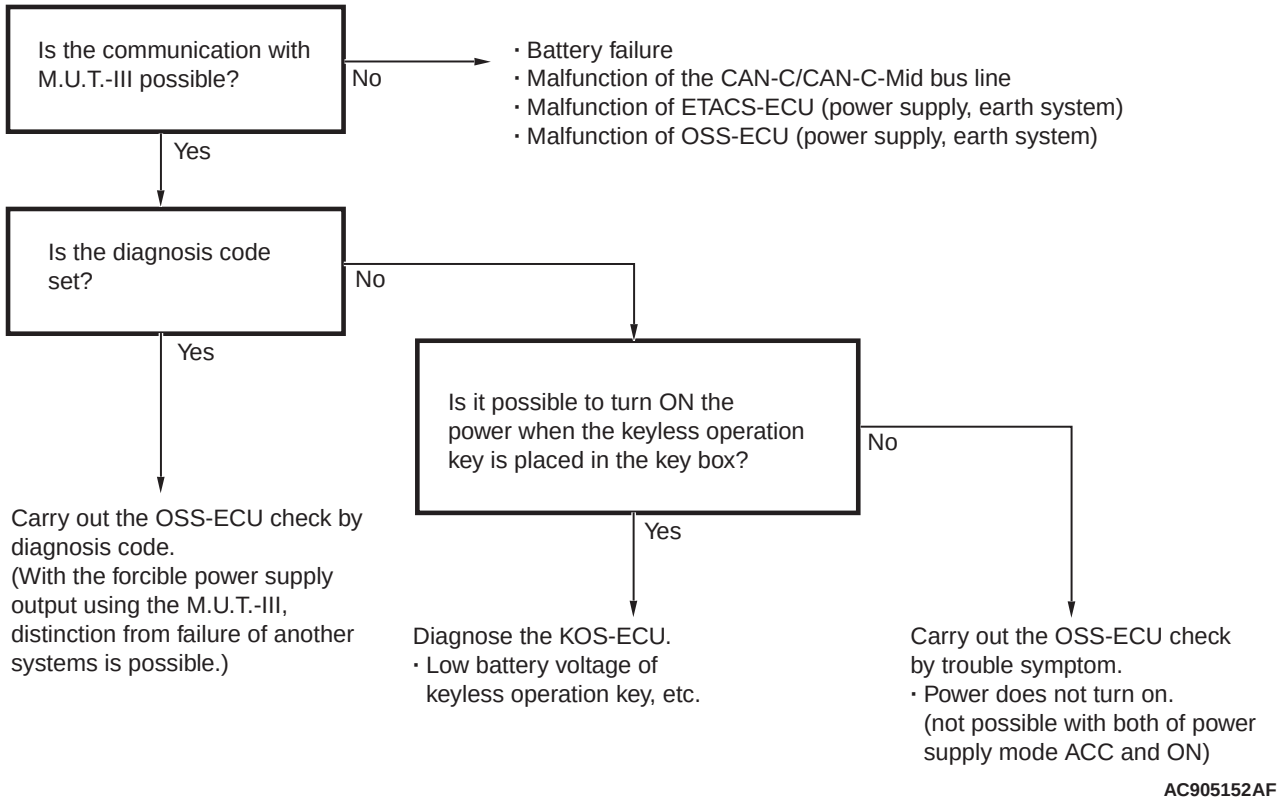
Item No.	Item name	Data item	Unit
1	Odometer	Total driving distance after the diagnosis code is generated	km
2	Ignition cycle	Number of times the power supply mode is turned "ON" or "OFF" after the past trouble transition.	Number of counts is displayed.
4	Current trouble accumulative time	Cumulative time for current malfunction of diagnosis code	min

TROUBLESHOOTING PROCEDURE WHEN VEHICLE POWER DOES NOT TURN ON

M1429628300042

When the power does not turn ON, open and close the driver's door several times. Then, check the communication between OSS-ECU and M.U.T.-III and others as shown in the flowchart below. (OSS-ECU can communicate with the M.U.T.-III even when the power supply is OFF.)

Simplified troubleshooting flow chart



AC905152AF

FORCED POWER SUPPLY OUTPUT PROCEDURE

M1429627400013

With OSS, the power supply cannot be turned ON until the certification communication with KOS and electrical steering lock is complete. However, using the M.U.T.-III, the power can be forced ON even when the certification communication with KOS and electrical steering lock is not completed. (However, locking/unlocking of the electrical steering lock is not performed.) Through this process, the error in certification with KOS or electrical steering lock can be distinguished from the malfunction in power supply. In addition, the process allows the CAN bus diagnosis as well as the reading of diagnosis code, belonging to systems other than OSS, to be performed.

NOTE: During the forced power supply output, the

FORCED POWER SUPPLY OUTPUT PROCEDURE

1. Connect the M.U.T.-III to the diagnosis connector.
2. On the M.U.T.-III system selection screen, select "OSS."
3. Select "Special Function" from OSS screen.
4. Select "Forced power supply output" from Special Function screen.
5. From the forced power supply output screen, select the status with which the control is desired. (Selection can be made from IG-ACC, IG-ON, and IG-ST.)
6. On the execution confirmation screen, select OK.
7. While the process is executed, the selected control status is maintained.

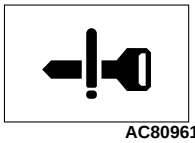
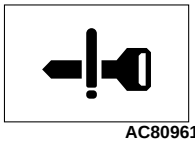
indicator flashes in orange.

8. To cancel the forced power supply output, select "Forced power supply output (stop)" on the Special Function screen, or operate the engine switch.

WARNING AND WARNING INDICATOR LIST <Standard meter>

M1429612300645

When OSS failed or operated improperly, OSS-ECU warns the driver to that effect by displaying the one-touch start system warning indicator on the combination meter.

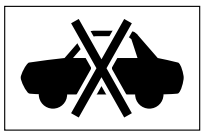
Item	Indicator	Factor	Warning operation
Immobilizer error	 AC904253	• Displayed when the certification communication fails with KOS, electrical steering lock, or engine-ECU. • Displayed when the power supply mode is turned ON while the keyless operation key is judged to be brought outside the vehicle with the power supply mode in ACC, or when the engine starting operation is performed after such a status. • Displayed when the electrical steering lock cannot be locked because there is a P detection switch malfunction.	• The warning indicator illuminates.
Steering turn indication	 AC904253	Displayed when the steering lock is not unlocked because the steering force is applied.	• The warning indicator flashes. • Buzzer sounds.
Electrical steering lock malfunction	 AC809615	Displayed when a malfunction occurs to the steering lock system.	• The warning indicator illuminates. • Buzzer sounds.
Steering lock not locked	–	The door is open with the steering lock not locked.	Buzzer sounds.
Power supply system error	 AC809615	Displayed when an error occurs to the power supply system.	• The warning indicator illuminates. • Buzzer sounds.
Power OFF indication	–	The door is open with the power supply mode in ON or in ACC.	Buzzer sounds.

WARNING AND WARNING INDICATOR LIST <High contrast meter>

M1429612300656

When OSS failed or operated improperly, KOS-ECU warns the driver to that effect by displaying the one-touch start system warning on the multi information display in the combination meter.

Item	Display contents		Factor
Immobilizer error	 AC904253	IMMOBILIZER SYSTEM SERVICE REQUIRED	• Displayed when the certification communication fails with KOS, electrical steering lock, or engine-ECU. • Displayed when the power supply mode is turned ON while the keyless operation key is judged to be brought outside the vehicle with the power supply mode in ACC, or when the engine starting operation is performed after such a status. • Displayed when the electrical steering lock cannot be locked because there is a P detection switch malfunction.
Steering turn indication	 AC904254	PUSH ENGINE SWITCH WHILE TURNING STEERING WHEEL	Displayed when the steering lock is not unlocked because the steering force is applied.
Electrical steering lock malfunction	 AC904255	STEERING LOCK SERVICE REQUIRED	Displayed when a malfunction occurs to the steering lock system.
Shift P indication	 AC904256	SHIFT TO P POSITION	Displayed if the shift lever is in other than "P" range when the engine is not running.
Steering lock not locked	 AC904257	STEERING WHEEL UNLOCKED	Displayed when the door is open with the steering lock not locked.

Item	Display contents		Factor
Power supply system error	 AC904260	ELECTRICAL SYSTEM SERVICE REQUIRED	Displayed when an error occurs to the power supply system.
Engine starting method	 AC904258	PRESS BRAKE PEDAL TO START ENGINE	Displayed when the shift lever is in other than "P" range or "N" range at the engine start, or when the engine switch is pressed without the brake pedal depressed.
Power OFF indication	 AC904252	–	Displayed when the door is open with the power supply mode in ON or in ACC.

DIAGNOSIS CODE CHART <OSS>

M1429600200964

Abnormality detecting ECU	Diagnosis code No.	Diagnostic item	Reference page
OSS-ECU	B1130	Ignition power supply	P.42B-54
	B1131	Starter setting circuit fail	P.42B-57
	B1132	Starter circuit fail	P.42B-58
	B1133	IG1 setting circuit fail	P.42B-59
	B1134	ECU power supply	P.42B-60
	B1135	Engine switch	P.42B-61
	B1136	Stop lamp switch	P.42B-62
	B1137	P range detect SW	P.42B-63
	B1139	KOS authentification timeout	P.42B-64
	B1140	KOS authentification error	P.42B-65
	B1141	ESL authentification timeout	P.42B-65
	B1142	ESL authentification error	P.42B-66
	B1143	ESL status fail	P.42B-66
	B1144	ESL actuation not completed	P.42B-67
	B1145	ESL drive circuit fail	P.42B-68
	B1146	ESL internal circuit fail	P.42B-68
	B1147	LIN communication stop control	P.42B-69
	B1148	ESL power supply	P.42B-70
	B1149	ESL drive circuit fail	P.42B-70

Abnormality detecting ECU	Diagnosis code No.	Diagnostic item	Reference page
Electrical steering lock unit	B1150	OSS authentification T/O.(ESL)	P.42B-71
	B1151	OSS authentification error(ESL)	P.42B-66
	B1152	ESL drive circuit fail(ESL)	P.42B-68
	B1153	ESL internal circuit fail(ESL)	P.42B-68
	B1154	ESL power supply fail(ESL)	P.42B-70
	B1155	EEPROM fail(ESL)	P.42B-71
OSS-ECU	B1157	EEPROM fail	P.42B-72
	B1158	ECU internal fail	
	B1159	Chassis No. not programmed	P.42B-72
	B1160	Key code not programmed	
	B1161	Chassis No. mismatch	P.42B-73
	B1163	Coding data mismatch	P.42B-73
	B1164	Chassis No. not programmed(ESL)	P.42B-72
	B1165	Key code not programmed(ESL)	
	B1166	Special mode	P.42B-74
	B1731	ENG ECU authentification timeout	P.42B-74
	B1A28	ENG ECU authentification error	P.42B-75
	U0141	ETACS CAN timeout	P.42B-75
	U0155	Meter CAN timeout	P.42B-75
	U0164	A/C CAN timeout	P.42B-76
	U0168	KOS CAN timeout	P.42B-76
	U1190	No receive fault detect signal	P.42B-77
	U1195	Coding not completed	P.42B-77

DIAGNOSIS CODE PROCEDURES

Code No.B1130 Ignition power supply

⚠ CAUTION

- **If the diagnosis code No. B1130 is set, always diagnose the CAN bus lines.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If the output power supply status is different from the engine switch status information received from ETACS-ECU via CAN, OSS-ECU sets the diagnosis code No.B1130. At the same time, OSS-ECU displays the power supply system error warning screen to the multi information display of the combination meter, and flashes the indicator of engine switch in orange.

JUDGEMENT CRITERIA

Check Conditions

- The terminal voltage of +B1 and +B2 is between 10 and 16 V.

Judgment Criterion

- Any of the following conditions is met, and 2 seconds or more have elapsed.
  a. The engine switch status information received from ETACS-ECU is other than OFF when the power supply mode of OSS is OFF.
  b. The engine switch status information received from ETACS-ECU is other than ACC when the power supply mode of OSS is ACC.
  c. The engine switch status information received from ETACS-ECU is other than ON when the power supply mode of OSS is ON.
  d. The engine switch status information received from ETACS-ECU is other than START when the power supply mode of OSS is START.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Damaged wiring harness or connector (short to earth, short to power supply, or open circuit in ACC line, IG1 line, or STO line)
- Malfunction of OSS-ECU
- ETACS-ECU malfunction

DIAGNOSIS PROCEDURE

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

After performing the forced power supply output (refer to P.42B-50) "IG-ON" using the M.U.T.-III, diagnose the CAN bus line.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. M.U.T.-III diagnosis code

Check if OSS-ECU diagnosis code No.B1131 or B1133 is set.

Q: Is the diagnosis code set?

YES : Troubleshoot for the relevant diagnosis code. Refer to P.42B-53.

NO : Go to Step 3.

STEP 3. M.U.T.-III other system data list

Operate the engine switch to change the power supply mode, and check that the data list display of ETACS-ECU is changed.

WHEN POWER SUPPLY MODE IS ACC (ENGINE SWITCH INDICATOR IS ILLUMINATED IN ORANGE)

ETACS-ECU data list		
Item No.	**Check item**	**Display**
288	ACC switch	ON

WHEN POWER SUPPLY MODE IS ON (ENGINE SWITCH INDICATOR IS ILLUMINATED IN GREEN)

ETACS-ECU data list		
Item No.	**Check item**	**Display**
254	IG voltage	System voltage

WHEN POWER SUPPLY MODE IS START (DURING CRANKING)

ETACS-ECU data list		
Item No.	**Check item**	**Display**
287	Starter switch	ON

Q: Is the check result normal?

All items agree with each other : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Do not match when power supply mode is ACC : Go to Step 4.

Do not match when power supply mode is ON : Go to Step 5.

Do not match when power supply mode is START (during cranking) : Go to Step 6.

STEP 4. Check of short to power supply, short to earth and open circuit in ACC line between OSS-ECU connector and ETACS-ECU connector

NOTE: Before the wiring harness check, check the joint connector, and repair if necessary.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the connector(s) or wiring harness.

STEP 5. Check of short to power supply, short to earth and open circuit in IG1 line between OSS-ECU connector and ETACS-ECU connector

NOTE: Before the wiring harness check, check the joint connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the connector(s) or wiring harness.

STEP 6. Check of short to power supply, short to earth and open circuit in STO line between OSS-ECU connector and ETACS-ECU connector

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the connector(s) or wiring harness.

STEP 7. M.U.T.-III data list
Check the OSS-ECU data list. (Check only where a problem is present.)

- Using the M.U.T.-III, perform the forced power supply output.

State of forced power supply output	Item No.	Check item	Display
IG-ON	15	IG1 output (monitor)	ON
			OFF
IG-ST	13	Cranking signal output(monitor)	ON
			OFF

OK: Depending on the state of forced power supply output, the display is turned ON/OFF.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 8. M.U.T.-III other system data list
Operate the engine switch to change the power supply mode, and check that the data list display of ETACS-ECU is changed. (Check only where a problem is present.)

WHEN POWER SUPPLY MODE IS ACC (ENGINE SWITCH INDICATOR IS ILLUMINATED IN ORANGE)

ETACS-ECU data list		
Item No.	**Check item**	**Display**
288	ACC switch	ON

WHEN POWER SUPPLY MODE IS ON (ENGINE SWITCH INDICATOR IS ILLUMINATED IN GREEN)

ETACS-ECU data list		
Item No.	**Check item**	**Display**
254	IG voltage	System voltage

WHEN POWER SUPPLY MODE IS START (DURING CRANKING)

ETACS-ECU data list		
Item No.	**Check item**	**Display**
287	Starter switch	ON

Q: Is the check result normal?
The power supply mode and data list change agree with each other : Go to Step 9.
The power supply mode and data list change do not agree with each other : Replace the ETACS-ECU.

STEP 9. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1131 Starter setting circuit fail

⚠ CAUTION

- **Use caution that the cooling fan becomes activated when the forced power supply output of M.U.T.-III is performed while the engine-ECU connector is disconnected. (Fail-safe for ETACS-ECU)**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When a short circuit (short to power supply, short to earth) of starter setting circuit system is detected, OSS-ECU sets the diagnosis code No.B1131. At the same time, OSS-ECU displays the power supply system error warning screen to the multi information display of the combination meter, and flashes the indicator of engine switch in orange.

JUDGEMENT CRITERIA

Check Conditions

- After OSS-ECU activation

Judgment Criterion

- When the following conditions are met:
  a. When the starter setting signal is ON, the starter setting circuit voltage is less than 1.5 V.
  b. When the starter setting signal is OFF, the circuit voltage is 3.5 V or more.

PROBABLE CAUSES

- Damaged wiring harness or connector (short to earth or short to power supply in ST line, STO line or STOE line)
- Malfunction of OSS-ECU
- ETACS-ECU malfunction
- Malfunction of engine-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in ST, STO line between OSS-ECU connector and ETACS-ECU connector

NOTE: Before the wiring harness check, check the joint connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the connector(s) or wiring harness.

STEP 2. Check of short to power supply, short to earth, and open circuit in STOE line between ETACS-ECU connector and engine-ECU connector

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the connector(s) or wiring harness.

STEP 3. Voltage measurement at engine-ECU connector (STOE terminal)

(1) Disconnect the engine-ECU connector, and measure at the wiring harness side.
(2) Using the M.U.T.-III, set the forced power supply output to other than "IG-ST".(Refer to P.42B-50.)
(3) Measure the voltage between the engine-ECU connector (STOE terminal) and body earth.

OK: 1 V or less

(4) Using the M.U.T.-III, set the forced power supply output to "IG-ST".(Refer to P.42B-50.)
(5) Measure the voltage between the engine-ECU connector (STOE terminal) and body earth.

OK: System voltage

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

STEP 4. M.U.T.-III data list

Check the OSS-ECU data list.
(1) Disconnect the engine-ECU connector.
(2) Using the M.U.T.-III, perform the forced power supply output.

State of forced power supply output	Item No.	Check item	Display
IG-ST	13	Cranking signal output(monitor)	ON
Other than IG-ST			OFF

OK: Depending on the state of forced power supply output, the display is turned ON/OFF.

Q: Is the check result normal?

YES : Replace the engine-ECU and register the chassis number and key codes [Refer to GROUP 00 – How to Perform Chassis Number (Chassis No.) Writing].
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 5. Voltage measurement at ETACS-ECU connector (STOE terminal)
(1) Measure the ETACS-ECU connector side by backprobing.
(2) Using the M.U.T.-III, set the forced power supply output to other than "IG-ST".(Refer to P.42B-50.)
(3) Measure the voltage between the ETACS-ECU connector (STOE terminal) and body earth.
OK: 1 V or less
(4) Using the M.U.T.-III, set the forced power supply output to "IG-ST".(Refer to P.42B-50.)
(5) Measure the voltage between the ETACS-ECU connector (STOE terminal) and body earth.
OK: System voltage

Q: Is the check result normal?
YES : Go to Step 6
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93). Then go to Step 6

STEP 6. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1132 Starter circuit fail

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

DIAGNOSTIC FUNCTION
When a short circuit (short to power supply) of starter setting circuit system is detected, or when an error to the starter starting circuit system is judged, OSS-ECU sets the diagnosis code No.B1132. At the same time, OSS-ECU displays the power supply system error warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- When the following conditions are met:
  a. When the starter setting signal is OFF, the cranking signal is received from engine-ECU.
  b. When the starter setting signal is OFF, the ignition start signal is received from ETACS-ECU.

PROBABLE CAUSES
- Damaged wiring harness or connector (short to power supply in ST line, STO line or STOE line)
- Engine starting circuit system error (NTSW line)
- Malfunction of engine-ECU
- ETACS-ECU malfunction
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III other system data list
Check the engine-ECU data list.
- Item No. 79: Cranking signal (Refer to GROUP 13A – Troubleshooting, Service Data Reference Table .)

Q: Is the check result normal?
YES : Go to Step 2
NO : Carry out the troubleshooting for the diagnosis code No.B1131. Refer to .

STEP 2. Check of short to power supply, short to earth, and open circuit in NTSW line between starter relay connector and engine-ECU connector

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the connector(s) or wiring harness.

STEP 3. M.U.T.-III other system data list
Check the ABS-ECU data list or ASC-ECU data list.
- Item No. 87: Ignition switch (input value) (Refer to GROUP 35B – Troubleshooting <ABS> or GROUP 35C – Troubleshooting <ASC>.)

Q: Is the check result normal?

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

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?

YES (Set after 10 seconds or more have elapsed since the engine switch ON) : Replace the engine-ECU and register the chassis number and key codes [Refer to GROUP 00 – How to Perform Chassis Number (Chassis No.) Writing].
YES (Set within 10 seconds since the engine switch ON) : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1133 IG1 setting circuit fail

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

DIAGNOSTIC FUNCTION

When a short circuit (short to power supply, short to earth) of IG1 setting circuit system is detected, OSS-ECU sets the diagnosis code No.B1133. At the same time, OSS-ECU displays the power supply system error warning screen to the multi information display of the combination meter, and flashes the indicator of engine switch in orange.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- When the following conditions are met:
  a. When the IG1 signal is ON, the IG1 circuit voltage is less than 1.5 V.
  b. When the IG1 signal is OFF, the IG1 circuit voltage is 3.5 V or more.

PROBABLE CAUSES

- Damaged wiring harness or connector (short to earth or short to power supply in IG1 line)
- Malfunction of OSS-ECU
- ETACS-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short to earth, and open circuit in IG1 line between OSS-ECU connector and ETACS-ECU connector

NOTE: Before the wiring harness check, check the joint connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the connector(s) or wiring harness.

STEP 2. Voltage measurement at ETACS-ECU connector (IG1 terminal)

(1) Measure the ETACS-ECU connector side by backprobing.
(2) Using the M.U.T.-III, set the forced power supply output to other than "IG-ON".(Refer to P.42B-50.)
(3) Measure the voltage between the ETACS-ECU connector (IG1 terminal) and body earth.

OK: 1 V or less

(4) Using the M.U.T.-III, set the forced power supply output to "IG-ON".(Refer to P.42B-50.)
(5) Measure the voltage between the ETACS-ECU connector (IG1 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 3. M.U.T.-III data list
Check the OSS-ECU data list.

Power supply mode	Item No.	Check item	Display
ON	15	IG1 output (monitor)	ON
Other than ON			OFF

OK: Depending on the state of power supply mode, the display is turned ON/OFF.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction)

Code No.B1134 ECU power supply

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

DIAGNOSTIC FUNCTION

When an open circuit is detected in one of the two systems of OSS power supply, OSS-ECU sets the diagnosis code No.B1134. At the same time, OSS-ECU displays the power supply system error warning screen to the multi information display of the combination meter, and flashes the indicator of engine switch in orange.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- When the following conditions are met, and 1 second or more has elapsed.
  a. +B1 is detected to be ON and +B2 is detected to be OFF.
  b. When +B1 is OFF and +B2 is ON, OSS-ECU detects that the IOD fuse is mounted.

PROBABLE CAUSES

- Damaged wiring harness or connector (open circuit in +B line)
- Malfunction of OSS-ECU
- ETACS-ECU malfunction

NOTE: If the IGN fuse (10 A) is blown, there may be a short to earth between the fuse and OSS-ECU or between the fuse and electric steering lock power supply. However, because the IGN fuse is branched off, determine the root cause while referring to the Electrical Wiring Manual.

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III data list
Check the OSS-ECU data list.

Item No.	Check item	Normal condition
18	+B1 Power supply voltage (AD)	System voltage
19	+B2 Power supply voltage (AD)	System voltage

OK: Normal values are displayed for all the items

Q: Is the check result normal?
Normal conditions are displayed for all the items. : Go to Step 4.
Normal condition is not displayed for item No.18 : Go to Step 2.
Normal condition is not displayed for item No.19 : Go to Step 3.

STEP 2. Check of short to power supply, short to earth, and open circuit in +B1 line between OSS-ECU connector and fusible link

NOTE: Before the wiring harness check, check the joint connector, ETACS-ECU connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check of short to power supply, short to earth, and open circuit in +B2 line between OSS-ECU connector and fusible link

NOTE: Before the wiring harness check, check the joint connector, ETACS-ECU connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness.

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1135 Engine switch

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

DIAGNOSTIC FUNCTION

When an abnormality is detected for 3 seconds or more with either of the SW1 or SW2 of engine switch, OSS-ECU sets the diagnosis code No.B1135, and displays the power supply system error warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- 3 seconds or more have elapsed since the unmatch between the SW1 and SW2 of engine switch is detected

PROBABLE CAUSES

- Engine switch malfunction (ON/OFF seizure of SW1 or SW2)
- Damaged wiring harness or connector (short to power supply, short to earth, or open circuit in SW1 or SW2 line)
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Engine switch check
Refer to P.42B-101.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the engine switch.

STEP 2. M.U.T.-III data list
Check the OSS-ECU data list.
- Operate the engine switch.

Operation state	Item No.	Check item	Display
When the engine switch is pressed	1	Engine switch(1)	ON
	2	Engine switch(2)	ON
When the engine switch is not pressed	1	Engine switch(1)	OFF
	2	Engine switch(2)	OFF

OK: Operation state and data list display agree with each other.

Q: Is the check result normal?
Normal conditions are displayed for all the items. : Go to Step 5.
Normal condition is not displayed for item No.1 : Go to Step 3.
Normal condition is not displayed for item No. 2. : Go to Step 4.

STEP 3. Check of short to power supply, short to earth, and open circuit in SW1 line between OSS-ECU connector and engine switch connector

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 4. Check of short to power supply, short to earth, and open circuit in SW2 line between OSS-ECU connector and engine switch connector

NOTE: Because the conformity cannot be determined even when the digital tester is used to measure the voltage of SW2 line between the OSS-ECU connector and engine switch connector, be sure to use the oscilloscope. (Outputs the sawtooth waveform of 0 to 5 V with intervals of 10 ms.)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 5. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?

YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1136 Stop lamp switch

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

DIAGNOSTIC FUNCTION

When an open circuit or short to earth is detected in the stop lamp switch circuit system, or when the actual stop lamp switch status is different from the stop lamp switch status received from the ETACS-ECU via CAN, the OSS-ECU sets diagnosis code No.B1136, and displays the power supply system error warning on the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- After OSS-ECU activation

Judgment Criterion

- When the following conditions are met:

The time when the OSS-ECU obtained the stop lamp switch status deviates 1.5 seconds from the time when the ETACS-ECU obtained it.

PROBABLE CAUSES

- Malfunction of CAN bus line
- Damaged wiring harness or connector (STP line, STP1 line)
- ETACS-ECU malfunction
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

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

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

Q: Is the check result normal?

YES : Go to Step 2
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting). On completion, go to Step 2.

STEP 2. Check of short to power supply, short of earth and open circuit in STP1 line between stop lamp switch connector and OSS-ECU connector

NOTE: Before the wiring harness check, check the intermediate connector, and repair if necessary.

Q: Is the check result normal?

YES : Go to Step 3
NO : Repair the connector(s) or wiring harness.

STEP 3. Check of short to power supply, short of earth and open circuit in STP line between stop lamp switch connector and ETACS-ECU connector

Q: Is the check result normal?

YES : Go to Step 4
NO : Repair the connector(s) or wiring harness.

STEP 4. M.U.T.-III other system data list

Check the ETACS-ECU data list.

- Item No.290: Stop lamp switch (Refer to GROUP 54A – ETACS, Service Data Reference Table .)

Q: Is the check result normal?

YES : Go to Step 5
NO : Diagnose the ETACS-ECU. (Refer to GROUP 54A – ETACS, Trouble Symptom Chart for Input Signal .)

STEP 5. M.U.T.-III data list

Check the OSS-ECU data list.

- Operate the brake pedal.

Operation state	Item No.	Check item	Display
Brake pedal is depressed	3	Stop lamp switch	ON
Brake pedal released			OFF

OK: Operation state and data list display agree with each other.

Q: Is the check result normal?

YES : Go to Step 6

NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 6. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?

YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1137 P range detect SW

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

If an error is detected in the P range detection switch circuit system when the vehicle speed is 10 km/h or more, OSS-ECU sets the diagnosis code No.B1137, and displays the immobiliser certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- Power supply mode: ON

Judgment Criterion

- When the vehicle speed is 10 km/h or more, 1 second or more has elapsed since the P range detection switch is detected to be OFF (selector lever is in P position).
- When the P range detection switch is OFF, the signal other than selector lever P position is received for 2 seconds or more.

PROBABLE CAUSES

- Damaged wiring harness or connector (short to power supply or open circuit in PDSW line)
- Selector lever assembly malfunction (OFF seizure of P range detection switch)
- Malfunction of the ABS-ECU or the ASC-ECU
- Malfunction of the CVT-ECU
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III other system diagnosis code

Check the diagnosis code of ABS-ECU or ASC-ECU and CVT-ECU.

Q: Is the diagnosis code set?

YES <Set in ABS-ECU or ASC-ECU> : Troubleshoot the ABS-ECU or ASC-ECU. (Refer to GROUP 35B – Troubleshooting <ABS> or GROUP 35C – Troubleshooting <ASC>.)

YES <Set in CVT-ECU> : Troubleshoot the CVT-ECU. (Refer to GROUP 23A – Troubleshooting .)

NO : Go to Step 2

STEP 2. Check of short to power supply, short to earth and open circuit in PDSW line between selector lever assembly connector and OSS-ECU connector

NOTE: Because the conformity cannot be determined even when the digital tester is used to measure the voltage of PDSW line between the selector lever assembly connector and OSS-ECU connector, be sure to use the oscilloscope. (Outputs the saw tooth waveform of 0 to 5 V with intervals of 10 ms.)

Q: Is the check result normal?

YES : Go to Step 3

NO : Repair the connector(s) or wiring harness.

STEP 3. Check of selector lever assembly (P range detection switch)

Disconnect the selector lever assembly connector, and check the continuity at the equipment side.

Item No.	Check item	Normal value
4 – 6	Selector lever: P position	No continuity
	Selector lever: Other than P position	Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 4

NO : Replace the selector lever assembly.

STEP 4. M.U.T.-III other system data list

Check the OSS-ECU data list.

- Operate the selector lever.

Operation state	Item No.	Check item	Display
Selector lever: P position	8	P range detect SW	Park position
Selector lever: Other than P position			Other than Park position

OK: Operation state and data list display agree with each other.

Q: Is the check result normal?

YES : Go to Step 5

NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 5. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?

YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No.B1139 KOS authentification timeout

DIAGNOSTIC FUNCTION

If the necessary data cannot be received from KOS-ECU via CAN during the certification communication with KOS-ECU, OSS-ECU sets the diagnosis code No.B1139, and displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- At KOS-ECU certification

Judgment Criterion

- During the certification communication with KOS-ECU, the necessary data cannot be received from KOS-ECU via CAN.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of KOS-ECU
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis (after turning the forced power supply output to "IG-ON" using the M.U.T.-III)
2. KOS diagnosis code check (after turning the forced power supply output to "IG-ON" using the M.U.T.-III)
3. OSS-ECU diagnosis code recheck

Code No.B1140 KOS authentification error

DIAGNOSTIC FUNCTION

If any abnormal data is received from KOS-ECU as a result of the certification communication with KOS-ECU, OSS-ECU sets the diagnosis code No.B1140, and displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- At KOS-ECU certification (at transition of power supply mode from OFF to ACC)

Judgment Criterion

- As a result of the certification communication with KOS-ECU, OSS-ECU receives the abnormal data from KOS-ECU.

PROBABLE CAUSES

- KOS-ECU malfunction (KOS-ECU has been interchanged between two vehicles, or various registrations are not complete after KOS-ECU replacement)
- Malfunction of the CAN bus line
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis (after turning the forced power supply output to "IG-ON" using the M.U.T.-III)
2. KOS-ECU diagnosis code check (after turning the forced power supply output to "IG-ON" using the M.U.T.-III)
3. OSS-ECU diagnosis code recheck

Code No. B1141 ESL authentification timeout

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

If the necessary data cannot be received from the electric steering lock via LIN during the certification communication with electric steering lock, OSS-ECU sets the diagnosis code No.B1141, and displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- At electric steering lock certification

Judgment Criterion

- During the certification communication with electric steering lock, the necessary data cannot be received from the electric steering lock via LIN.

PROBABLE CAUSES

- LIN bus line malfunction (open circuit, short to earth, or short to power supply in LIN line)
- Damaged wiring harness or connector (open circuit or short to earth in PCO line, or open circuit in PWR line)
- Electric steering lock malfunction
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check of open circuit in PWR line between electric steering lock connector and fusible link

NOTE: Before the wiring harness check, check the joint connector, ETACS-ECU connector, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the connector(s) or wiring harness.

STEP 2. Check of short to power supply, short of earth, and open circuit in PCO line between electric steering lock connector and OSS-ECU connector

NOTE: Because the conformity cannot be determined even when the digital tester is used to measure the voltage of PCO line between the selector lever assembly connector and OSS-ECU connector, be sure to use the analogue tester. (With the keyless operation key placed outside of the vehicle, if the tester needle swings to the battery voltage when the engine switch is operated, it is judged normal.)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check of short to power supply, short of earth, and open circuit in LIN line between electric steering lock connector and OSS-ECU connector

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness.

STEP 4. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93). Then go to Step 5.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : The diagnosis is complete.

Code No. B1142 ESL authentification error
Code No. B1151 OSS authentification timeout(ESL)

DIAGNOSTIC FUNCTION

If the electric steering lock receives any abnormal data from OSS-ECU as a result of the certification communication with electric steering lock, OSS-ECU sets the diagnosis codes No.B1142 and No.B1151. At the same time, OSS-ECU displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions
- At electric steering lock certification

Judgment Criterion
- As a result of the certification communication with electric steering lock, the electric steering lock receives the abnormal data from OSS-ECU.

PROBABLE CAUSES
- Electric steering lock malfunction (electric steering lock has been interchanged between two vehicles)
- OSS-ECU malfunction (OSS-ECU has been interchanged between two vehicles)

DIAGNOSIS PROCEDURE

STEP 1. After turning the forced power supply output to "IG-ON" using the M.U.T.-III, check if the diagnosis code No.B1161 is set.

Q: Is the diagnosis code set?
YES : Carry out the troubleshooting for the diagnosis code No.B1161. Refer to P.42B-73.
NO : Go to Step 2.

STEP 2. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. B1143 ESL status fail

DIAGNOSTIC FUNCTION

If a status error is received from the electric steering lock via LIN, OSS-ECU sets the diagnosis code No.B1143, and displays the immobiliser certification system inspection warning screen to the multi information display of the combination meter.

NOTE: In addition, when the electric steering lock was replaced, the diagnosis code No.B1143 may be set with the electric steering lock locked (a new electric steering lock is in the unlocked status). Therefore, before the diagnosis code recheck of after the replacement of electric steering lock, be sure to perform the locking control of the electric steering lock first.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- Status abnormality is received from the electric steering lock via LIN.

PROBABLE CAUSES
- Electric steering lock malfunction
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93). Then go to Step 2.
NO : Go to Step 2.

STEP 2. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. B1144 ESL actuation not completed

DIAGNOSTIC FUNCTION
If the control completion information cannot be received from the electric steering lock via LIN when the electric steering lock is locked/unlocked, OSS-ECU sets the diagnosis code No.B1144. At the same time, OSS-ECU displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- Control completion information is not received from the electric steering lock.

PROBABLE CAUSES
- Electric steering lock malfunction
- LIN bus line malfunction
- Malfunction of OSS-ECU

YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short of earth and open circuit in LIN line between electric steering lock connector and OSS-ECU connector

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the connector(s) or wiring harness.

STEP 2. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93). Then go to Step 3.
NO : Go to Step 3.

STEP 3. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. B1145 ESL drive circuit fail
Code No. B1152 ESL drive circuit fail(ESL)

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

DIAGNOSTIC FUNCTION
When an error is detected to the driving circuit of electric steering lock, OSS-ECU sets the diagnosis codes No.B1145 and No.B1152. At the same time, OSS-ECU displays the immobiliser certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA
Check Conditions
- At electric steering lock certification

Judgment Criterion
- Abnormal signal is received from the electric steering lock.

PROBABLE CAUSES
- Damaged wiring harness or connector (open circuit or short to earth in PCK line)
- Electric steering lock malfunction
- Malfunction of KOS-ECU
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III other system diagnosis code
After turning the forced power supply output to "IG-ON" using the M.U.T.-III, check the diagnosis code of KOS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the KOS. Refer to P.42B-11.
NO : Go to Step 2.

STEP 2. Check of short to power supply, short of earth and open circuit in PCKM line between KOS-ECU connector and OSS-ECU connector

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93). Then go to Step 4.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : The diagnosis is complete.

Code No. B1146 ESL internal circuit fail
Code No. B1153 ESL internal circuit fail(ESL)

DIAGNOSTIC FUNCTION
When an error is detected to the internal circuit of electric steering lock, OSS-ECU sets the diagnosis codes No.B1146 and No.B1153. At the same time, OSS-ECU displays the immobiliser certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA
Check Conditions
- At electric steering lock certification

Judgment Criterion
- Abnormal signal is received from the electric steering lock.

PROBABLE CAUSES
- Electric steering lock malfunction

DIAGNOSIS PROCEDURE

1. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code of OSS-ECU.

Code No. B1147 LIN communication stop control

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

DIAGNOSTIC FUNCTION

When an error has occurred to the termination processing of LIN communication with the electric steering lock and the processing cannot be terminated normally, OSS-ECU sets the diagnosis code No.B1147.

JUDGEMENT CRITERIA

Check Conditions
- At electric steering lock certification

Judgment Criterion
- LIN communication with the electric steering lock cannot be terminated normally.

PROBABLE CAUSES

- LIN bus line malfunction (open circuit, short to earth, or short to power supply in LIN line)
- Damaged wiring harness or connector (open circuit or short to earth in PCO line, or open circuit in PWR line)
- Electric steering lock malfunction
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Check of open circuit in PWR line between electric steering lock connector and fusible link

NOTE: Before the wiring harness check, check the joint connector, ETACS-ECU, and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the connector(s) or wiring harness.

STEP 2. Check of short to power supply, short to earth, and open circuit in PCO line between electric steering lock connector and OSS-ECU connector

NOTE: Because the conformity cannot be determined even when the digital tester is used to measure the voltage of PCO line between the selector lever assembly connector and OSS-ECU connector, be sure to use the analogue tester. (With the keyless operation key placed outside of the vehicle, if the tester needle swings to the battery voltage when the engine switch is operated, it is judged normal.)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check of short to power supply, short to earth, and open circuit in LIN line between electric steering lock connector and OSS-ECU connector

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness.

STEP 4. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93). Then go to Step 5.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : The diagnosis is complete.

Code No. B1148 ESL power supply
Code No. B1154 ESL power supply fail(ESL)

DIAGNOSTIC FUNCTION

When a short circuit (short to power supply) is detected in the power supply (microcomputer) circuit system of the electric steering lock, OSS-ECU sets the diagnosis codes No.B1148 and No.B1154. At the same time, OSS-ECU displays the steering lock abnormality warning screen to the multi information display of the combination meter. Also, when the diagnosis code No.B1148 is the past trouble, the LIN bus may have a problem.

JUDGEMENT CRITERIA

Check Conditions

- At electric steering lock certification

Judgment Criterion

- Short circuit (short to power supply) in the power supply (microcomputer) circuit system of the electric steering lock is detected.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Electric steering lock malfunction
- Malfunction of OSS-ECU
- LIN bus malfunction <B1148 is the past trouble>

DIAGNOSIS PROCEDURE

STEP 1. Check of short to power supply, short of earth, and open circuit in PCO line between electric steering lock connector and OSS-ECU connector

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the connector(s) or wiring harness.

STEP 2. After performing the locking and unlocking operations of the electric steering lock, recheck the diagnosis code.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock and register the chassis number (Refer to P.42B-93). Then go to Step 3.
NO : Go to Step 3.

STEP 3. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction)

Code No. B1149 ESL drive circuit fail

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

DIAGNOSTIC FUNCTION

When a short to power supply is detected in the electric steering lock driving circuit during the engine start or during travelling, OSS-ECU sets the diagnosis code No.B1149. At the same time, OSS-ECU displays the steering lock abnormality warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- When all the following conditions are met.
  a. Power supply mode: ON
  b. Battery voltage: 8 V or more
  c. During travelling (vehicle speed of 6 km/h or more) or engine is running (engine speed of 60 r/min or more)

Judgment Criterion

- 1 second or more has elapsed after the PCKM voltage is judged to be 3.5 V or more.

PROBABLE CAUSES

- Damaged wiring harness or connector (short to power supply in PCK line)
- Malfunction of KOS-ECU
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III other system diagnosis code

After turning the forced power supply output (refer to P.42B-50) to "IG-ON" using the M.U.T.-III, check the diagnosis code of KOS-ECU.

Q: Is the diagnosis code set?

YES : Diagnose the KOS. Refer to P.42B-53.

NO : Go to Step 2.

STEP 2. Check of short to power supply, short of earth, and open circuit in PCK line between KOS-ECU connector and OSS-ECU connector

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness.

STEP 3. M.U.T.-III data list

Check the OSS-ECU data list.

Operation state	Item No.	Check item	Display
After starting the engine	9	ESL drive permission signal(KOS)	OFF
Other than above			ON

OK: Operation state and data list display agree with each other.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93)

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?

YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93)

NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction)

Code No.B1150 OSS authentification T/O.(ESL)

DIAGNOSTIC FUNCTION

If the electric steering lock cannot receive the necessary data from OSS-ECU via LIN during the certification communication, OSS-ECU sets the diagnosis code No.B1150. Also, when the diagnosis code No.B1150 is the past trouble, the LIN bus may have a problem.

JUDGEMENT CRITERIA

Check Conditions

- At electric steering lock certification

Judgment Criterion

- During the certification communication, the electric steering lock cannot receive the necessary data from OSS-ECU via LIN.

PROBABLE CAUSES

- Malfunction of OSS-ECU
- LIN bus malfunction <at past trouble>

DIAGNOSIS PROCEDURE

1. OSS-ECU diagnosis code recheck

Code No. B1155 EEPROM fail(ESL)

DIAGNOSTIC FUNCTION

When the EEPROM writing/reading error of the electric steering lock is detected, OSS-ECU sets the diagnosis code No.B1155.

JUDGEMENT CRITERIA

Check Conditions

- After OSS-ECU activation

Judgment Criterion
- When the following conditions are met:
  a. EEPROM writing/reading error is detected.
  b. ECU internal circuit error is detected.

PROBABLE CAUSES
- Electric steering lock malfunction

DIAGNOSIS PROCEDURE

Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the electric steering lock, and register the chassis number.(Refer to P.42B-93.)
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. B1157 OSS EEPROM fail
Code No. B1158 OSS ECU internal fail

DIAGNOSTIC FUNCTION
- When an EEPROM writing/reading error of OSS-ECU is detected, OSS-ECU sets the diagnosis code No.B1157, and flashes the indicator of engine switch in orange.
- When an error is detected to the microcomputer in OSS-ECU, OSS-ECU sets the diagnosis code No.B1158, and flashes the indicator of engine switch in orange.

JUDGEMENT CRITERIA

Check Conditions
- After OSS-ECU activation

Judgment Criterion
- When the following conditions are met:
  a. EEPROM writing/reading error is detected.
  b. ECU internal circuit error is detected.

PROBABLE CAUSES
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

Code No. B1159 Chassis No. not programmed (OSS)
Code No. B1160 Key code not programmed (OSS)
Code No. B1164 Chassis No. not programmed(ESL)
Code No. B1165 Key code not programmed(ESL)

⚠ CAUTION
- **When the diagnosis code No.B1159, B1160, B1164, or B1165 is set, be sure to diagnose the CAN bus line.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
- OSS-ECU sets the diagnosis code No.B1159 when the chassis number is not written to OSS-ECU, and the diagnosis code No.B1160 when the key code is not written.

NOTE: When OSS-ECU is new, the diagnosis codes No.B1159 and No.B1160 are set simultaneously.
- OSS-ECU sets the diagnosis code No.B1164 when the chassis number is not written to the electric steering lock, and the diagnosis code No.B1165 when the key code is not written.

NOTE: When the electric steering lock is new, the diagnosis codes No.B1164 and No.B1165 are set simultaneously.

JUDGEMENT CRITERIA

Judgment Criterion

- Chassis number or key code has the initial value (not written)

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Chassis number not written
- Key code not written
- Malfunction of OSS-ECU
- Electric steering lock malfunction

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis <when B1159 or B1160 is set>
2. Chassis number registration
3. OSS-ECU diagnosis code recheck

Code No. B1161 Chassis No. mismatch

⚠ CAUTION

- **When the diagnosis code No.B1161 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 chassis number registered in OSS-ECU is different from the chassis number transmitted by engine-ECU on the CAN bus line, OSS-ECU sets the diagnosis code No.B1161.

JUDGEMENT CRITERIA

Check Conditions

- When all the following conditions are met.
  a. Power supply mode: ON
  b. Chassis number written in OSS-ECU

Judgment Criterion

- The chassis number received via CAN communication is different from the chassis number written in OSS-ECU.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Writing error of chassis number to engine-ECU (engine-ECU has been interchanged between two vehicles, or chassis number has not been written after engine-ECU replacement)
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. Check of chassis number in engine-ECU
3. OSS-ECU diagnosis code recheck

Code No. B1163 Coding data mismatch

⚠ CAUTION

- **When the diagnosis code No.B1163 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 coding data registered in OSS-ECU is different from the coding data transmitted on the CAN bus, OSS-ECU sets the diagnosis code No.B1163. At the same time, OSS-ECU displays the power supply system error warning screen to the multi information display of the combination meter, and flashes the indicator of engine switch in orange.

JUDGEMENT CRITERIA

Check Conditions

- For 5 seconds since the start of the reception of ignition status signal (ON or during cranking) transmitted from ETACS-ECU.

Judgment Criterion

- A coding data is received which is different from the current coding status.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- ETACS-ECU malfunction
- ETACS-ECU has been interchanged between two vehicles
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis

2. ETACS-ECU diagnosis code check
3. ETACS-ECU coding data check
4. OSS-ECU diagnosis code recheck

Code No. B1166 Special mode

DIAGNOSTIC FUNCTION

When OSS-ECU is in the special operation mode (ECU is new), OSS-ECU sets the diagnosis code No.B1166, and flashes the indicator of engine switch in green. When the engine switch is pressed, only the power supply mode of the vehicle can be changed without key certification.

NOTE: After the chassis number and key code are written, the operation mode shifts to the normal operation mode when the certification communication becomes valid at an engine switch operation, and the diagnosis code No.B1166 is erased.

JUDGEMENT CRITERIA

Judgment Criterion

- During special operation mode

PROBABLE CAUSES

- Chassis number not written
- Key code not written
- Malfunction of OSS-ECU
- KOS-ECU malfunction (registration is not complete after the simultaneous replacement with OSS-ECU)
- Keyless operation key malfunction (registration is not complete after the simultaneous replacement with OSS-ECU)
- Electric steering lock malfunction (registration is not complete after the simultaneous replacement with OSS-ECU)

DIAGNOSIS PROCEDURE

1. Check the KOS diagnosis code.
2. Check if OSS-ECU diagnosis code No.B1159, B1160, B1164, or B1165 is set.
3. After operating the engine switch from ON to OFF twice, recheck the diagnosis code of OSS-ECU.

Code No. B1731 ENG ECU authentification timeout

⚠ CAUTION

- **When the diagnosis code No. B1731 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 necessary data cannot be received from engine-ECU via CAN bus line during the engine starting certification with engine-ECU, OSS-ECU determines that a problem has occurred, and sets the diagnosis code No.B1731. At the same time, OSS-ECU displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions

- At engine starting certification

Judgment Criterion

- At the engine starting certification with engine-ECU, necessary data cannot be received from engine-ECU via CAN bus line.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of engine-ECU
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. Engine-ECU diagnosis code check
3. OSS-ECU diagnosis code recheck

Code No. B1A28 ENG ECU authentification error

⚠ CAUTION
- **If the diagnosis code No. B1A28 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the OSS certification result is different from the engine status after the completion of engine starting permission communication, OSS-ECU determines that a problem has occurred, and sets the diagnosis code No.B1A28. At the same time, OSS-ECU displays the immobilizer certification system inspection warning screen to the multi information display of the combination meter.

JUDGEMENT CRITERIA

Check Conditions
- At engine starting certification

Judgment Criterion
- Certification result unmatch is received from engine-ECU.

PROBABLE CAUSES
- Writing error of chassis number to engine-ECU (engine-ECU has been interchanged between two vehicles, or chassis number has not been written after engine-ECU replacement)
- Malfunction of the CAN bus line
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE
1. M.U.T.-III CAN bus diagnosis
2. Checking whether OSS-ECU diagnosis code No.B1161 is set
3. OSS-ECU diagnosis code recheck

Code No. U0141 ETACS CAN timeout

⚠ CAUTION
- **If diagnosis code No. U0141 is set, be sure to diagnose the CAN bus line.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the signal from ETACS-ECU cannot be received, OSS-ECU sets the diagnosis code No.U0141.

JUDGEMENT CRITERIA

Check Conditions
- When all the following conditions are met.
  a. Power supply mode: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion
- After the following condition is met, 2,500 ms or more have elapsed.
  a. CAN signal from ETACS-ECU cannot be received.

PROBABLE CAUSES
- Malfunction of the CAN bus line
- ETACS-ECU malfunction
- Malfunction of ETACS-ECU power supply circuit
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE
1. M.U.T.-III CAN bus diagnosis
2. Diagnosis code check of combination meter
3. OSS-ECU diagnosis code recheck

Code No. U0155 Meter CAN timeout

⚠ CAUTION
- **If diagnosis code No. U0155 is set, be sure to diagnose the CAN bus line.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the signal from the combination meter cannot be received, OSS-ECU sets the diagnosis code No.U0155.

JUDGEMENT CRITERIA

Check Conditions

- When all the following conditions are met.
  a. Power supply mode: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion

- After the following condition is met, 2,500 ms or more have elapsed.
  a. CAN signal from the combination meter cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Combination meter malfunction
- Malfunction of combination meter power supply circuit
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. ETACS-ECU diagnosis code check
3. OSS-ECU diagnosis code recheck

Code No. U0164 A/C CAN timeout

⚠ CAUTION

- **If diagnosis code No. U0164 is set, be sure to diagnose the CAN bus line.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signal from the heater control unit or A/C-ECU cannot be received, OSS-ECU sets the diagnosis code No.U0164.

JUDGEMENT CRITERIA

Check Conditions

- When all the following conditions are met.
  a. Power supply mode: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion

- After the following condition is met, 2,500 ms or more have elapsed.
  a. CAN signal from the heater control unit or A/C-ECU cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of heater control unit or A/C-ECU
- Malfunction of heater control unit or A/C-ECU power supply circuit
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. ETACS-ECU diagnosis code check
3. OSS-ECU diagnosis code recheck

Code No. U0168 KOS CAN timeout

⚠ CAUTION

- **If diagnosis code No. U0168 is set, be sure to diagnose the CAN bus line.**
- **Before replacing ECU, ensure that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

When the signal from KOS-ECU cannot be received, OSS-ECU sets the diagnosis code No.U0168.

JUDGEMENT CRITERIA

Check Conditions

- When all the following conditions are met.
  a. Power supply mode: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion

- After the following condition is met, 2,500 ms or more have elapsed.
  a. CAN signal from KOS-ECU cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of KOS-ECU
- Malfunction of KOS-ECU power supply circuit
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. ETACS-ECU diagnosis code check

3. OSS-ECU diagnosis code recheck

Code No. U1190: No receive fault detect signal

⚠ CAUTION
- **If the diagnosis code No. U1190 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the signal from the ETACS-ECU cannot be received, OSS-ECU sets the diagnosis code No.U1190.

JUDGEMENT CRITERIA

Check Conditions
- When all the following conditions are met.
  a. Power supply mode: ON
  b. ETACS-ECU system voltage is at 10 to 16 V.

Judgment Criterion
- After the following condition is met, 5,000 ms or more have elapsed.
  a. CAN signal from the ETACS-ECU cannot be received.

PROBABLE CAUSES
- Malfunction of the CAN bus line
- Malfunction of ETACS-ECU
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

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

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III other system diagnosis code
Check again if the diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS-ECU (Refer to GROUP 54A, Troubleshooting).
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Check again if the diagnosis code is set to the SRS-ECU.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU.
NO : Go to Step 4.

STEP 4. Diagnosis code recheck
Check again if the diagnosis code is set to the OSS-ECU.
(1) Erase the diagnosis code.
(2) Turn the engine switch from the LOCK (OFF) position to the ON position.
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU.
NO : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to cope with Intermittent Malfunction).

Code No. U1195 Coding not completed

⚠ CAUTION
- **If diagnosis code No. U1195 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION
When the coding data is not registered, OSS-ECU sets the diagnosis code No.U1195.

Judgment Criterion

JUDGEMENT CRITERIA

Check Conditions
- When all the following conditions are met.
  a. Coding is not completed.
  b. For 5 seconds since the start of the reception of ignition status signal (ON or during cranking) transmitted from ETACS-ECU.

- Any of the coding is not completed normally.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Variant coding for ETACS-ECU has not been implemented.
- Malfunction of OSS-ECU
- ETACS-ECU malfunction

DIAGNOSIS PROCEDURE

1. M.U.T.-III CAN bus diagnosis
2. ETACS-ECU diagnosis code check
3. OSS-ECU diagnosis code recheck

DATA LIST REFERENCE TABLE

M1429605000318

Item No.	Check item	Check condition	Normal condition
1	Engine switch(1)	When the engine switch is pressed	ON
		When the engine switch is not pressed	OFF
2	Engine switch(2)	When the engine switch is pressed	ON
		When the engine switch is not pressed	OFF
3	Stop lamp switch	When the brake pedal is depressed	ON
		When the brake pedal is released	OFF
8	P range detect SW	Shift the selector lever to the position other than the P position.	Outside park
		Shift the selector lever to the P position.	Park
9	ESL drive permission signal(KOS)	After starting the engine	OFF
		Other than above	ON
13	Cranking signal output(monitor)	Cranking	ON
		Other than above	OFF
15	IG1 output (monitor)	Power supply mode is turned ON or the engine is being started by the pressing of engine switch.	ON
		Other than above	OFF
16	IG2 output (monitor)	Power supply mode is turned ON.	ON
		Other than above	OFF
17	OSS power supply status*	Power supply mode is abnormal.	Default or SNA
		Power supply mode is OFF.	IG OFF
		Power supply mode is ACC.	IG ACC
		Power supply mode is ON.	IG ON
		Ignition switch ON	IG START
		Ignition switch ON	IG RUN(judging)
18	+B1 Power supply voltage (AD)	Always	System voltage
19	+B2 Power supply voltage (AD)	Always	System voltage
20	ESL unlock SW(1)	Unlock SW (1) is abnormal.	Default or SNA
		Electric steering lock: Unlock	ON
		Electric steering lock: Lock	OFF
21	ESL lock SW	Lock SW is abnormal.	Default or SNA
		Electric steering lock: Unlock	OFF
		Electric steering lock: Lock	ON

Item No.	Check item	Check condition	Normal condition
22	ESL unlock SW(2)	Unlock SW (2) is abnormal.	Default or SNA
		Electric steering lock: Unlock	ON
		Electric steering lock: Lock	OFF
23	ESL status	Electric steering lock is abnormal.	Default or SNA
		Electric steering lock: Lock or unlock drive	Driving
		Electric steering lock is not in operation.	Stop
		Electric steering lock is in fail-safe operation.	Fail

NOTE:
- **: Indicates the output status of OSS-ECU.*

ACTUATOR TEST TABLE

M1429605100155

Item No.	Item name	Test item	Driven component
1	Engine switch(Control)	ON	Operate the engine switch once.
2	Engine switch(LED ON)	LED selection (Orange, Green, Character)	Indicator of engine switch is illuminated.

NOTE: When the actuator test item No.1 is executed, the engine switch indicator flashes in orange.

SPECIAL FUNCTION TABLE

M1429627900030

ECU INFORMATION

Function name (M.U.T.-III display)	Contents
ECU Information	Displays the Chassis Number/VIN (Original) and Chassis Number/VIN (Current).

FORCED POWER SUPPLY OUTPUT

Function name (M.U.T.-III display)	Contents
Forced power supply output	Performs the forced power supply output (IG-ACC, IG-ON, or IG-ST).

FORCED POWER SUPPLY OUTPUT (STOP)

Function name (M.U.T.-III display)	Contents
Forced power supply output(stop)	Stops the forced power supply output.

TROUBLE SYMPTOM CHART

M1429604501067

Trouble symptom	Inspection procedure number	Reference page
Abnormality in OSS-ECU power supply and earth circuit	1	P.42B-80
Vehicle power does not turn ON (not possible with both of power supply mode ACC and ON)	2	P.42B-81
Vehicle power does not turn ON (Not possible with power supply mode ACC only)	3	P.42B-82

Trouble symptom	Inspection procedure number	Reference page
Vehicle power does not turn ON (Not possible with power supply mode ON only)	4	P.42B-83
Engine does not start (cranking is not performed)	5	P.42B-83
Vehicle power cannot be turned OFF when the shift position is in "P" (Power supply mode ON to ACC is possible)	6	P.42B-85
Electric steering lock does not become locked. (Power supply mode is OFF.)	7	P.42B-86

SYMPTOM PROCEDURES

Inspection Procedure 1: Abnormality in OSS-ECU power supply and earth circuit

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

COMMENTS ON TROUBLE SYMPTOM

When OSS-ECU cannot communicate with the M.U.T.-III, the power supply or earth circuit system of OSS-ECU may be faulty.

PROBABLE CAUSES

- Damaged harness wires and connectors
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. Resistance measurement at OSS-ECU connector (PGND terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the OSS-ECU connector (PGND terminal) and body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Check of open circuit in PGND line between OSS-ECU connector and earth joint connector

NOTE: Before the wiring harness check, check the joint connector, and repair if necessary.

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).
NO : Repair the connector(s) or wiring harness.

STEP 3. Resistance measurement at OSS-ECU connector (SGND terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the OSS-ECU connector (SGND terminal) and body earth.

OK: Continuity exists (2 Ω or less)

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

STEP 4. Check of open circuit in SGND line between OSS-ECU connector and earth joint connector

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).
NO : Repair the connector(s) or wiring harness.

STEP 5. Voltage measurement at OSS-ECU connector (+B1 terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Check the voltage between the OSS-ECU

connector (+B1 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check of short to power supply, short to earth, and open circuit in +B1 line between fusible link and OSS-ECU connector

NOTE: Before the wiring harness check, check the ETACS-ECU connector and joint connector, and repair if necessary.

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).
NO : Repair the connector(s) or wiring harness.

STEP 7. Voltage measurement at OSS-ECU connector (+B2 terminal)

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Check the voltage between the OSS-ECU connector (+B2 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).
NO : Go to Step 8.

STEP 8. Check of short to power supply, short to earth, and open circuit in +B1 line between fusible link and OSS-ECU connector

NOTE: Before the wiring harness check, check the ETACS-ECU connector and joint connector, and repair if necessary.

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).
NO : Repair the connector(s) or wiring harness.

Inspection Procedure 2: Vehicle power does not turn ON. (not possible with both of power supply mode ACC and ON)

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

COMMENTS ON TROUBLE SYMPTOM

When the vehicle power does not turn ON (not possible with both of power supply mode ACC and ON), the battery, CAN bus line, OSS-ECU, OSS-ECU power supply, or earth circuit may have a problem.

NOTE: OSS-ECU can communicate with the M.U.T.-III even when the engine switch is in the "OFF" position.

PROBABLE CAUSES

- Malfunction of battery
- Damaged wiring harness and connectors
- Malfunction of engine switch (poor connector contact, poor engine switch contact)
- Malfunction of the CAN bus line
- Malfunction of OSS-ECU
- ETACS-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. Battery check

Perform the battery test to check the battery status. (Refer to GROUP 54A – Battery .)

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the battery.

STEP 2. Check that the M.U.T.-III communicates with this system.

Check that the communication with M.U.T.-III is possible.

NOTE: If ETACS-ECU is not active, OSS-ECU cannot communicate with the M.U.T.-III.

(1) Perform the ON/OFF operation of any of the door switches for several times, or open any of the doors.
(2) Check that OSS-ECU can communicate with the M.U.T.-III.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Carry out the troubleshooting of "OSS-ECU power supply or earth circuit malfunction".(Refer to P.42B-80.)

STEP 3. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting).

STEP 4. M.U.T.-III diagnosis code
Check if the diagnosis code is set to OSS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the OSS. Refer to P.42B-53.
NO : Go to Step 5.

STEP 5. Engine switch check
Continuity check of engine switch (Refer to P.42B-101.)

Q: Is the check result normal?
YES : Go to Step 6.
NO : Replace the engine switch.

STEP 6. Check of the troubles
Check that the vehicle power can be turned ON.

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).
NO : Carry out the troubleshooting relevant to the input signal of ETACS-ECU. (Refer to GROUP 54A – ETACS .) Then, go to Step 7.

STEP 7. Check of the troubles
Check that the vehicle power can be turned ON.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

Inspection Procedure 3: Vehicle power does not turn ON. (Not possible with power supply mode ACC only)

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

COMMENTS ON TROUBLE SYMPTOM
When the vehicle power does not turn ON (not possible with power supply mode ACC only), the possible cause may be that the OSS-ECU cannot output the ACC signal, or that the ACC internal relay of ETACS-ECU does not turn ON. Therefore, OSS-ECU or ETACS-ECU may have a problem.

PROBABLE CAUSES
- Malfunction of OSS-ECU
- Malfunction of ETACS-ECU
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if the diagnosis code is set to OSS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the OSS. Refer to P.42B-53.
NO : Go to Step 2.

STEP 2. Voltage measurement at ETACS-ECU connector (ACC terminal)
(1) With the ETACS-ECU connector kept connected, measure by backprobing.
(2) Using the M.U.T.-III, set the forced power supply output to "IG-ACC".(Refer to P.42B-50.)
(3) Measure the voltage between the ETACS-ECU connector (ACC terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 3. Check of the troubles
Check that the vehicle power (power supply mode ACC) can be turned ON.

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).
NO : Carry out the troubleshooting relevant to the input signal of ETACS-ECU. (Refer to GROUP 54A – ETACS .)

Inspection Procedure 4: Vehicle power does not turn ON. (Not possible with power supply mode ON only)

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

COMMENTS ON TROUBLE SYMPTOM
If the vehicle power does not turn ON (not possible with power supply mode ON only), the possible cause may be that the OSS-ECU cannot output the IG1 signal, or that the IG1 internal relay of ETACS-ECU does not turn ON. Therefore, OSS-ECU or ETACS-ECU may have a problem.

PROBABLE CAUSES
- Malfunction of OSS-ECU
- Malfunction of ETACS-ECU
- Damaged harness wires and connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if the diagnosis code is set to OSS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the OSS. Refer to P.42B-53.
NO : Go to Step 2.

STEP 2. Voltage measurement at ETACS-ECU connector (IG1 terminal)
(1) With the ETACS-ECU connector kept connected, measure by backprobing.
(2) Using the M.U.T.-III, set the forced power supply output to "IG-ON".(Refer to P.42B-50.)
(3) Measure the voltage between the ETACS-ECU connector (IG1 terminal) and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 3. Check of the troubles
Check that the vehicle power (power supply mode ON) can be turned ON.

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).
NO : Carry out the troubleshooting relevant to the input signal of ETACS-ECU. (Refer to GROUP 54A – ETACS .)

Inspection Procedure 5: Engine does not start (cranking is not performed).

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

COMMENTS ON TROUBLE SYMPTOM
When the engine does not start (cranking is not performed), the battery malfunction, stop lamp switch malfunction, engine starting circuit malfunction, or OSS-ECU malfunction may be present.

PROBABLE CAUSES
- Malfunction of battery
- Damaged wiring harness or connector (open circuit in STOE line)
- Error in engine starting circuit system
- Stop lamp switch malfunction
- Malfunction of the CAN bus line
- Malfunction of OSS-ECU
- Malfunction of AS&G-ECU
- Engine-ECU malfunction
- ETACS-ECU malfunction

PROBABLE CAUSES

STEP 1. Battery check
Perform the battery test to check the battery status. (Refer to GROUP 54A – Battery .)

Q: Is the check result normal?
YES : Go to Step 2
NO : Replace the battery.

STEP 2. M.U.T.-III diagnosis code
Check if the diagnosis code is set to OSS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the OSS-ECU. Refer to P.42B-53.
NO : Go to Step 3

STEP 3. M.U.T.-III data list

Check the OSS-ECU data list.

- Operate the brake pedal.

Operation state	Item No.	Check item	Display
Brake pedal is depressed	3	Stop lamp switch	ON
Brake pedal released			OFF

OK: Operation state and data list display agree with each other.

Q: Is the check result normal?

YES : Go to Step 5

NO : Go to Step 4

STEP 4. Stop Lamp Switch Check

Continuity check of stop lamp switch (Refer to GROUP 35A – Brake Pedal).

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).

NO : Replace the stop lamp switch.

STEP 5. Voltage measurement at ETACS-ECU connector (STOE terminal)

(1) With the ETACS-ECU connector kept connected, measure by backprobing.

(2) Using the M.U.T.-III, set the forced power supply output to other than "IG-ST".(Refer to P.42B-50.)

(3) Measure the voltage between the ETACS-ECU connector (STOE terminal) and body earth.

OK: 1 V or less

(4) Using the M.U.T.-III, set the forced power supply output to "IG-ST".(Refer to P.42B-50.)

(5) Measure the voltage between the ETACS-ECU connector (STOE terminal) and body earth.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 6

NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

STEP 6. M.U.T.-III other system data list

Check the engine-ECU data list.

(1) Using the M.U.T.-III, set the forced power supply output to "IG-ST".(Refer to P.42B-50.)

(2) Check the engine-ECU data list.

Item No.	Check item	Display
79	Cranking signal (Ignition switch-ST)	ON

OK: Operation state and data list display agree with each other.

(3) Using the M.U.T.-III, set the forced power supply output to other than "IG-ST".(Refer to P.42B-50.)

(4) Check the engine-ECU data list.

Item No.	Check item	Display
79	Cranking signal (Ignition switch-ST)	OFF

OK: Operation state and data list display agree with each other.

Q: Is the check result normal?

YES : Go to Step 8

NO : Go to Step 7

STEP 7. Check of open circuit in STOE line between ETACS-ECU connector and engine-ECU connector

Q: Is the check result normal?

YES : Replace the engine-ECU and register the chassis number and key codes [Refer to GROUP 00 – How to Perform Chassis Number (Chassis No.) Writing].

NO : Repair the connector(s) or wiring harness.

STEP 8. Check of the troubles

Check whether the engine is started (cranking is performed).

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).

NO : There is a problem with the engine starting circuit system of engine-ECU. Carry out the troubleshooting relevant to the engine starting circuit system. (Refer to GROUP 13A – Troubleshooting .)

Inspection Procedure 6: Vehicle power cannot be turned OFF when the shift position is in "P." (Power supply mode ON to ACC is possible)

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

COMMENTS ON TROUBLE SYMPTOM

When the shift position is judged to be in the P position based on the input of P range detection switch, OSS-ECU can turn OFF the vehicle power supply. If the vehicle power cannot be turned OFF (power supply mode ON to ACC is possible) when the shift is in P position, the P range detection switch or OSS-ECU may have a problem.

PROBABLE CAUSES

- Damaged wiring harness or connector (short to earth in PDSW line)
- Malfunction of selector lever assembly (ON seizure of P range detection switch)
- Malfunction of OSS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check if the diagnosis code is set to OSS-ECU.

Q: Is the diagnosis code set?
YES : Diagnose the OSS-ECU. Refer to P.42B-53.
NO : Go to Step 2.

STEP 2. Check of short to earth in PDSW line between selector lever assembly connector and OSS-ECU connector

NOTE: Because the conformity cannot be determined even when the digital tester is used to measure the voltage of PDSW line between the selector lever assembly connector and OSS-ECU connector, be sure to use the oscilloscope. (Outputs the sawtooth waveform of 0 to 5 V with intervals of 10 ms.)

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check of selector lever assembly (P range detection switch)
Disconnect the selector lever assembly connector, and check the continuity at the equipment side.

Terminal No.	Operation state	Normal conditions
4 – 6	Selector lever: P position	No continuity
	Selector lever: Other than P position	Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the selector lever assembly.

STEP 4. M.U.T.-III data list
Check the OSS-ECU data list.
- Operate the selector lever.

Operation state	Item No.	Check item	Display
Selector lever: P position	8	P range detect SW	Outside park
Selector lever: Other than P position			Park

OK: Operation state and data list display agree with each other.

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).
NO : Replace the OSS-ECU and register the chassis number (Refer to P.42B-93).

Inspection Procedure 7: Electric steering lock does not become locked. (At power supply mode OFF)

COMMENTS ON TROUBLE SYMPTOM

The electric steering lock performs the locking operation by using the opening/closing of the door (ON/OFF of door switch) as a trigger. If the electric steering lock is not unlocked, the door switch circuit system or the electric steering lock may have a problem.

PROBABLE CAUSES

- Malfunction of OSS-ECU
- Malfunction of the door switch
- Electric steering lock malfunction
- Damaged harness wires and connectors

PROBABLE CAUSES

STEP 1. M.U.T.-III diagnosis code

Check if the diagnosis code is set to OSS-ECU.

Q: Is the diagnosis code set?

YES : Diagnose the OSS. Refer to P.42B-53.

NO : Go to Step 2.

STEP 2. M.U.T.-III other system data list

Check the ETACS-ECU data list.

- Open the each door.

Item No.	Check item	Normal condition
Item 256	Dr door ajar switch	Open
Item 257	As door ajar switch	Open
Item 258	RR door ajar switch	Open
Item 259	RL door ajar switch	Open

OK: Normal condition is displayed.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Diagnose the ETACS-ECU. Refer to .

STEP 3.Check of the troubles

Check if the electric steering lock becomes locked when the power supply mode is OFF.

Q: Is the check result normal?

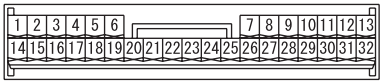
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).

NO : Replace the electric steering lock and register the chassis number (Refer to P.42B-93).

TERMINAL VOLTAGE REFERENCE CHART

M1429606800696

OSS-ECU TERMINAL CHECK



AC905484

Terminal number	Terminal code	Check item	Check conditions	Normal conditions
1	CANH	CAN bus line	–	–
2	SGND	Earth (for signal)	Always	1 V or less
3	–	–	–	–
4	LEDA	Engine switch LED (orange) ON signal	Power supply mode: ACC	System voltage
5	LEDG	Engine switch LED (green) ON signal	Power supply mode: ON	System voltage

Terminal number	Terminal code	Check item	Check conditions	Normal conditions
6	LEDW	Engine switch LED (character illumination) ON signal	Always	System voltage
7	IG1	IG1 output signal	Power supply mode: ON	System voltage
			Power supply mode: Other than ON	1 V or less
8 - 9	–	–	–	–
10	ACC	ACC output signal	Power supply mode: ACC	System voltage
			Power supply mode: Other than ACC	1 V or less
11	IG2	IG2 output signal	Power supply mode: ON (Without cranking)	System voltage
			Power supply mode: Other than ON	1 V or less
12	BKOS	Back-up power supply for KOS	When the engine switch is pressed to turn the power supply mode OFF	System voltage
13	+B1	Battery power supply	Always	System voltage
14	CANL	CAN bus line	–	–
15	PGND	Earth (for CPU)	Always	1 V or less
16	LIN	LIN bus line (local) for electric steering lock	–	–
17	PDSW	P position detection signal	Selector lever: P position	0 to 5 V (pulse signal)
			Selector lever: Other than P position	1 V or less
18	–	–	–	–
19	SW2	Engine switch ON/OFF detection signal	When the engine switch is pressed	1 V or less
			When the engine switch is not pressed	0 to 5 V (pulse signal)
20	–	–	–	–
21	PCK	Actuator driving permission monitoring signal	At engine start and when KOS power is OFF	1 V or less
			Other than above	System voltage
22	–	–	–	–
23	ST	Starter output signal	Cranking	System voltage
			Other than above	1 V or less
24	–	–	–	–
25	PCO	Power control output terminal for electric steering lock	Power supply mode: OFF	System voltage
			Power supply mode: Other than OFF	1 V or less
26	–	–	–	–

Terminal number	Terminal code	Check item	Check conditions	Normal conditions
27	STP1	Stop lamp switch ON/OFF detection signal	When the brake pedal is depressed	System voltage
			When the brake pedal is released	1 V or less (pulse signal)
28	–	–	–	–
29	SW1	Engine switch ON/OFF detection signal	When the engine switch is pressed	System voltage
			When the engine switch is not pressed	1 V or less
30	–	–	–	–
31	IG2M	IG2 relay drive status detection signal	At ACC, OFF or during engine cranking	1 V or less
			Other than above	System voltage
32	+B2	Battery power supply	Always	System voltage

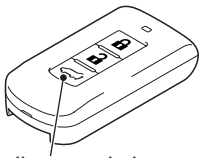
ON-VEHICLE SERVICE <KOS-ECU>

ID CODES REGISTRATION PROCEDURES

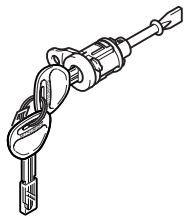
M1429611700985

For the details of key registration procedure, refer to the ID registration procedure manual.

KEY SUPPLY UNIT

Keyless operation key	Emergency key
 Electric tailgate switch <Vehicles with electric tailgate> ACC00107AB	 AC610642

KEY SUPPLY UNIT LIST FOR OTHER THAN INDIVIDUAL KEY

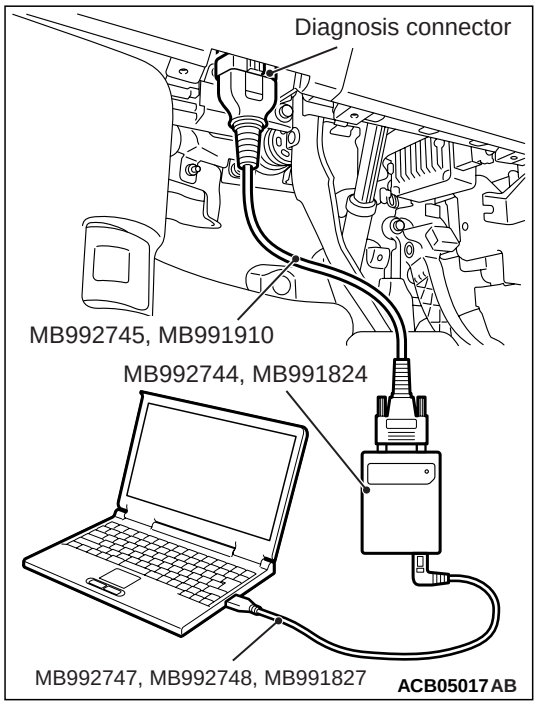
Door service key set ***NOTE: It is the key that comes with the door service key set. It can only be used for locking and unlocking, and it cannot start the engine.***
 AC608188

ANTENNA COMMUNICATION TEST

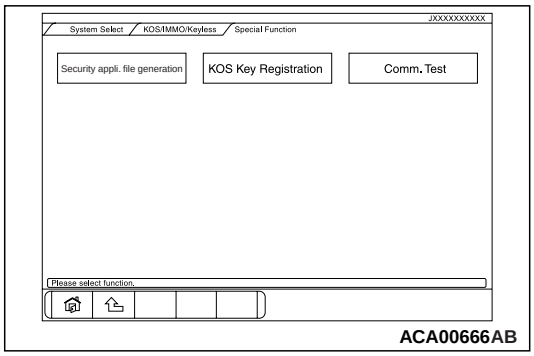
M1429606400201

Through the operations on the M.U.T.-III screen, the antenna communication tests can be performed.

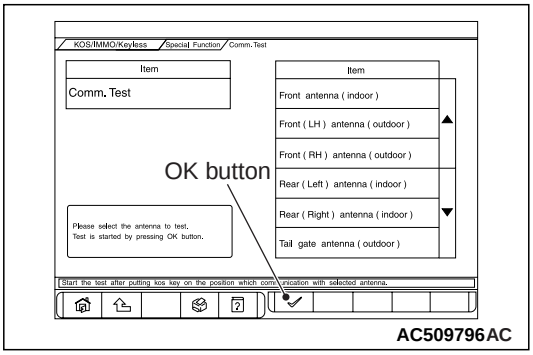
NOTE: For details on how to use the M.U.T.-III, refer to the "M.U.T.-III User's Manual."



1. Start the M.U.T.-III system on the PC
2. Select "KOS/IMMO/Keyless" 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 "Comm. Test" on the "Special Function" screen.



5. Select the antenna to be tested on "Comm. Test" screen, and press the OK button with the keyless operation key placed within the communication operational area.
6. Push the OK button after "Communication is normal." is displayed.

KEYLESS ENTRY SYSTEM CHECK

M1429611800227

Check the keyless entry system as described below. If it does not work, perform troubleshooting (Refer to P.42B-33).

- Operate the keyless operation key to check that the doors and tailgate can be locked and unlocked.

- Operate the keyless operation key to check that the answerback function works in response to door and tailgate locking/unlocking.

NOTE: The hazard answerback setting can be changed using the customisation function. Confirm which setting is activated before performing these checks (Refer to P.42B-90).

INSPECTION OF MULTI-MODE KEYLESS ENTRY FUNCTION

M1429612100328

Operate the keyless operation key to check that the electric-folding door mirrors <Vehicles with electric retractable remote controlled door mirrors> work. If they do not work, carry out troubleshooting (Refer to P.42B-33).

NOTE: The settings of the operation of the electric-folding door mirrors <Vehicles with electric retractable remote controlled door mirrors> can be changed using the customisation function. Confirm which settings are activated before performing diagnosis (Refer to P.42B-90).

INSPECTION OF KEYLESS ENTRY TIMER LOCK FUNCTION

M1429612200240

Attempt to unlock the doors by using the keyless operation key. If the doors are not locked within 30 seconds, carry out troubleshooting. Note that the doors will not be locked if the ignition key is inserted within the 30-second period, one of the doors is opened is triggered. Refer to P.42B-33.

NOTE: The operation time of the keyless entry timer lock function can be set using the customisation function. Confirm the operation time before performing the diagnosis. Refer to P.42B-90.

POWER DOOR LOCKS WITH SELECTIVE UNLOCKING INSPECTION

M1429619600205

Check the power door locks with selective unlocking as described below. If it does not work, perform troubleshooting (Refer to P.42B-33).

NOTE: The setting of the power door locks with selective unlocking can be changed using the customisation function. Confirm which setting is activated before performing these checks. Refer to P.42B-90.

- Press the unlock switch on the keyless operation key once to unlock only the driver's door. Press the unlock switch of the keyless operation key once again within 2 seconds after the driver's door is unlocked, and check that the front passenger's door, rear doors, and tailgate are unlocked.

NOTE: Press the unlock switch on the keyless operation key once to unlock only the driver's door. When the unlock switch of the keyless operation key is pressed once again more than 2 seconds after the driver's door is unlocked, only the driver's door is unlocked.

- Press the lock and unlock switch on the door outside handle (driver’s side) once to unlock only the driver's door. Press the lock and unlock switch of the door outside handle (driver’s side) once again within 2 seconds after the driver's door is unlocked, and check that the front passenger's door, rear doors, and tailgate are unlocked.

NOTE: Press the lock and unlock switch on the door outside handle (driver’s side) once to unlock only the driver's door. When the lock and unlock switch of the door outside handle (driver’s side) is pressed once again more than 2 seconds after the driver's door is unlocked, only the driver's door is unlocked.

CUSTOMISATION FUNCTION

M1429611601066

By operating the M.U.T.-III ETACS system, the following functions can be customised. The programmed information is held even when the battery is disconnected.

Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting content (M.U.T.-III display)	Adjusting content
Hazard answer back	Adjustment of the number of keyless hazard warning lamp answer back flashes	Lock:1, Unlock:2	LOCK: Flashes once, UNLOCK: Flashes twice (initial condition)
		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	No function
Auto fold mirror	Electric folding door mirror automatic unfolding function <vehicles with electric retractable remote controlled door mirrors>	Not Auto	No synchronised operation
		Open Vehicle SPD	Vehicle speed-dependent operation
		Open/Close by IG	Ignition switch linked operation
		OPN/CLS Keyless	Keyless entry linked operation (initial condition)
Auto door unlock	Adjustment of the auto door unlock function	Disable	Without function (initial condition)
		Always (P pos)	With function: Operates when the shift lever or the selector lever is moved to the P position.
		Always(Lock pos)	With function: Operates when the ignition switch is moved to the LOCK (OFF) position.
Door unlock mode	Adjustment of power door locks with selective unlocking	All Doors Unlock	Without function: The first operation of keyless entry system or unlock operation by KOS unlocks all doors (initial condition).
		Dr Door Unlock	With function: The first operation of keyless entry system or unlock operation by KOS unlocks the driver's door only, and the second unlock operation within 2 seconds after that unlocks all doors.
Timer lock timer	Timer lock period adjustment	30 sec.	30 seconds (initial condition)
		60 sec.	60 seconds
		120 sec.	120 seconds
		180 sec.	180 seconds
Multi mode	Multi-mode keyless entry function customisation <Vehicles with electric retractable remote controlled door mirrors>	Disable	No function
		D/M: O&C	Door mirror fold/unfold operation only (initial condition)

Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting content (M.U.T.-III display)	Adjusting content
KOS key detect out from window	With/without KOS key exterior detection function <Vehicles with KOS>	Enable	No function
		Disable	With function (initial condition)
KOS feature	KOS function adjustment <Vehicles with KOS>	Both enable	All KOS functions are enabled (initial condition).
		Door Entry enable	Only door entry function is enabled.
		ENG start enable	Only engine starting function is enabled.
		Both disable	All KOS functions are disabled.
KOS unlock disable time	Adjusts the door unlock inhibition period after door lock is activated. <Vehicles with KOS>	0 sec.	0 second
		3 sec.	3 seconds (Initial condition)
		5 sec.	5 seconds
Outer buzzer volume	Volume adjustment for the KOS outer buzzer <Vehicles with KOS>	Volume 1	Quieter than the standard
		Volume 2	Standard volume (Initial condition)
		Volume 3	Louder than the standard

ON-VEHICLE SERVICE <OSS-ECU>

POWER SUPPLY MODE BY ENGINE SWITCH OPERATION

M1429627000026

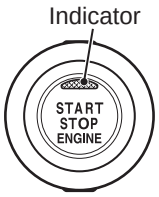
When the engine switch is pressed, the power supply mode changes according to the shift position and brake pedal operation state.

Shift position	Brake pedal operation	Power supply mode at engine switch operation
P position	Released	Every time the switch is pressed, the power supply mode changes from OFF to ACC to ON to OFF.
	Depressed	While the power supply mode is OFF, the engine is started when the switch is pressed.
		While the power supply mode is ACC, the engine is started when the switch is pressed.
		While the power supply mode is ON, the engine is started when the switch is pressed.
	Depressed or released	When the switch is pressed after the engine is started, the power supply mode is turned OFF (the engine stops).
Other than P position	Depressed or released	When the switch is pressed while the power supply mode is ACC, the power supply mode is turned ON.
		When the switch is pressed while the power supply mode is ON, the power supply mode is turned to ACC.
		When the switch is pressed after the engine is started, the power supply mode is turned to ACC.

CHECK OF ENGINE SWITCH INDICATOR FUNCTION

M1429627100023

Check that the engine switch indicator is switched as follows in each power supply mode and when an error is detected.

INDICATOR	Power supply mode and at error detection	INDICATOR
 AC904994AB	OFF	Extinguished
	ACC	Illuminated in orange
	ON	Illuminated in green
	ON (after engine start)	Extinguished at 3 seconds after the engine is started
	System error	Flashes in orange
	Special operation mode *	Flashes in green (when ACC and ON only)

*NOTE: *: The special operation mode indicates that OSS-ECU is brand new.*

CHECK OF ENGINE SWITCH REMINDER BUZZER

M1429620300026

1. With the driver's door kept closed, release the steering lock, and then turn the power supply mode to ACC or ON.
2. Open the driver's door.
3. Check that the buzzer sounds normally.
4. If there is a malfunction, troubleshoot the combination meter. (Refer to GROUP 54A – Combination Meter, Trouble Symptom Chart .)

REGISTRATION WHEN REPLACING OSS-ECU AND ELECTRIC STEERING LOCK

M1429627200031

⚠ CAUTION

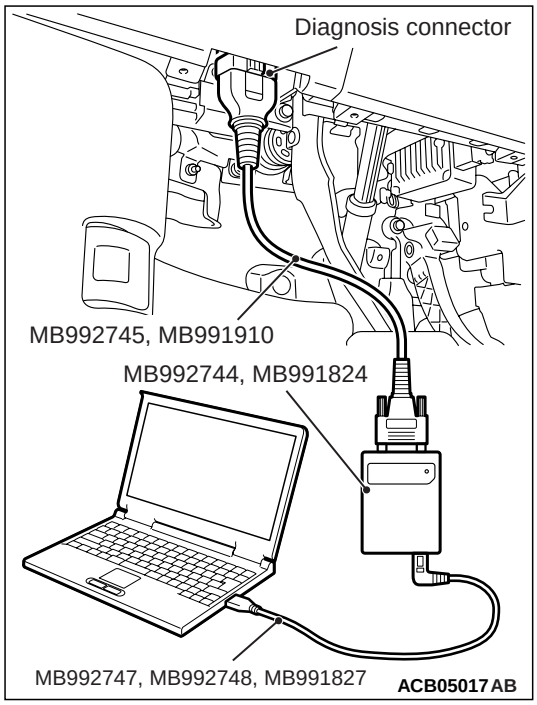
- **When KOS-ECU is replaced, all the registrations that need to be performed at KOS-ECU replacement must be completed before the registration of OSS-ECU and electric steering lock.**
- **Be sure to check that the diagnosis code No.B1157 OSS EEPROM error and No.B1155 ESL EEPROM error are not set. If the diagnosis code No.B1157 "OSS EEPROM error" and No.B1155 "ESL EEPROM error" are set, the chassis number cannot be stored in memory even when it is written. Therefore, when these diagnosis codes are set, be sure to carry out the troubleshooting first to repair the trouble, and then write the chassis number to OSS-ECU or electric steering lock.**

When OSS-ECU or electric steering lock is replaced, the chassis number needs to be registered to the replaced ECU.

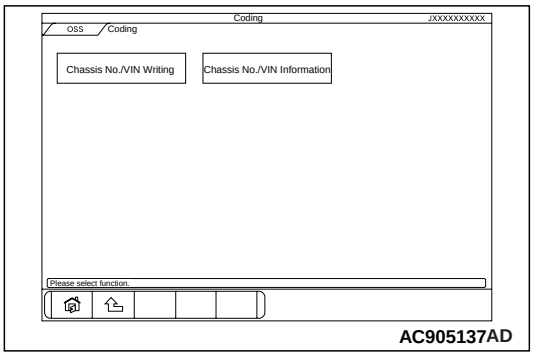
CHASSIS NUMBER REGISTRATION PROCEDURE

NOTE: Regardless of which of OSS-ECU or electric steering lock is replaced, the registration can be performed by executing the same menu selection. (Even when both OSS-ECU and electric steering lock were replaced as a set, they can be registered by performing the registration process only once.)

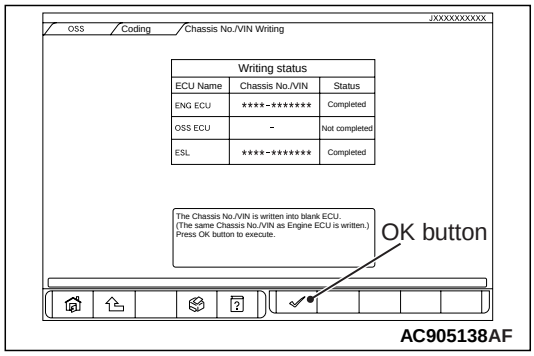
1. Replace the OSS-ECU or electric steering lock.

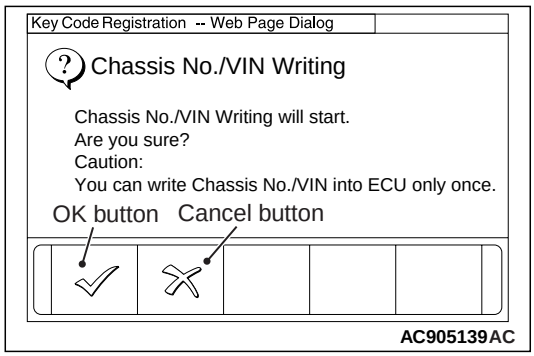


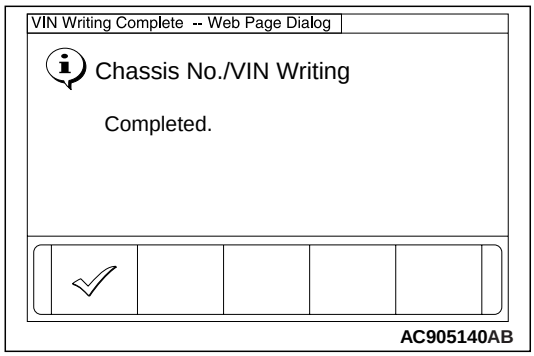
2. Connect M.U.T.-III to the diagnosis connector.
3. From the system selection screen of M.U.T.-III, select "OSS".
4. From the OSS function menu screen, select "Coding".



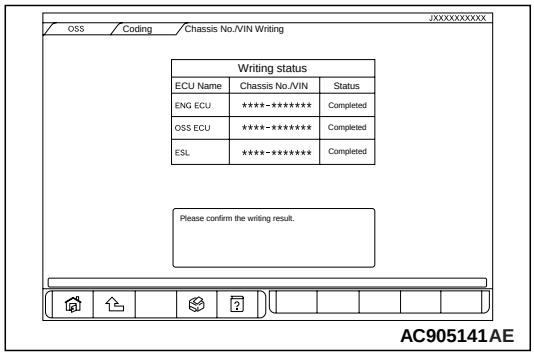
5. From the coding menu screen, select "Chassis No./VIN Writing."







6. Following the instruction on the screen, press the OK button to execute the chassis number writing. (M.U.T. screen above indicates when OSS-ECU is replaced.)



7. On the writing result confirmation screen, check that the chassis number is written, and finish the registration.
8. Operate the engine switch to turn OFF the power supply.

NOTE: After the M.U.T.-III has executed the chassis number writing, it will turn the engine switch on forcibly. Therefore, after completion, turn the engine switch off.

9. Set the driver's door from open to close or from close to open.
10. Carrying the keyless operation key, perform the engine switch operation to turn the power from OFF to ON twice.
11. Check that the OSS-ECU diagnosis code (B1160, B1164, B1165, B1166 or U1199) is not set, and finish the registration.

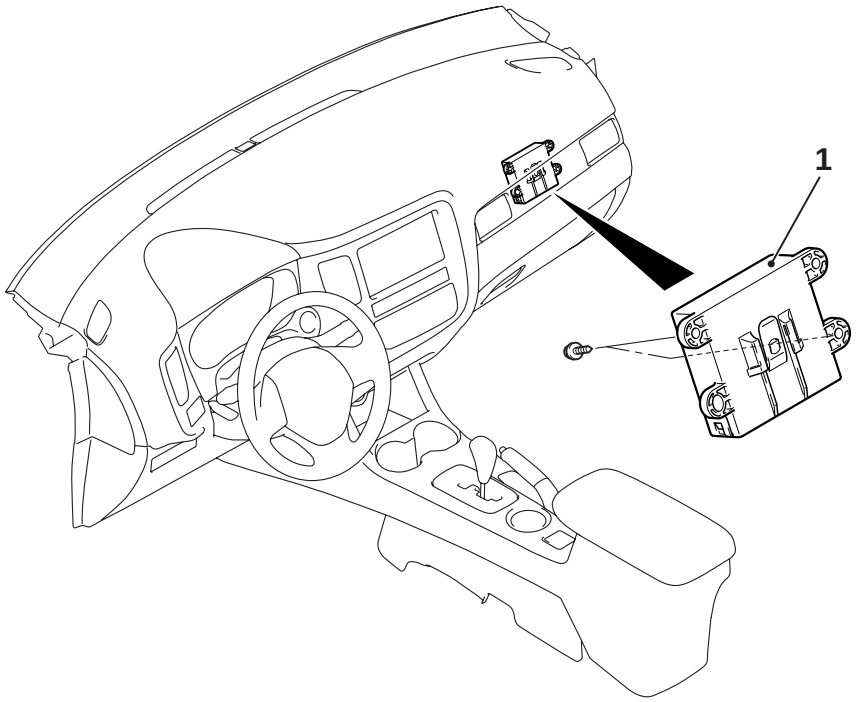
KOS-ECU

REMOVAL AND INSTALLATION

M1429605900407

⚠ CAUTION

If KOS-ECU is replaced, refer to ID code registration need judgement table P.42B-88 to complete the registration of each ID code.



ACB05639AB

Removal steps

- Upper glove box assembly (Refer to GROUP 52A – Instrument panel assembly .)

Removal steps (Continued)

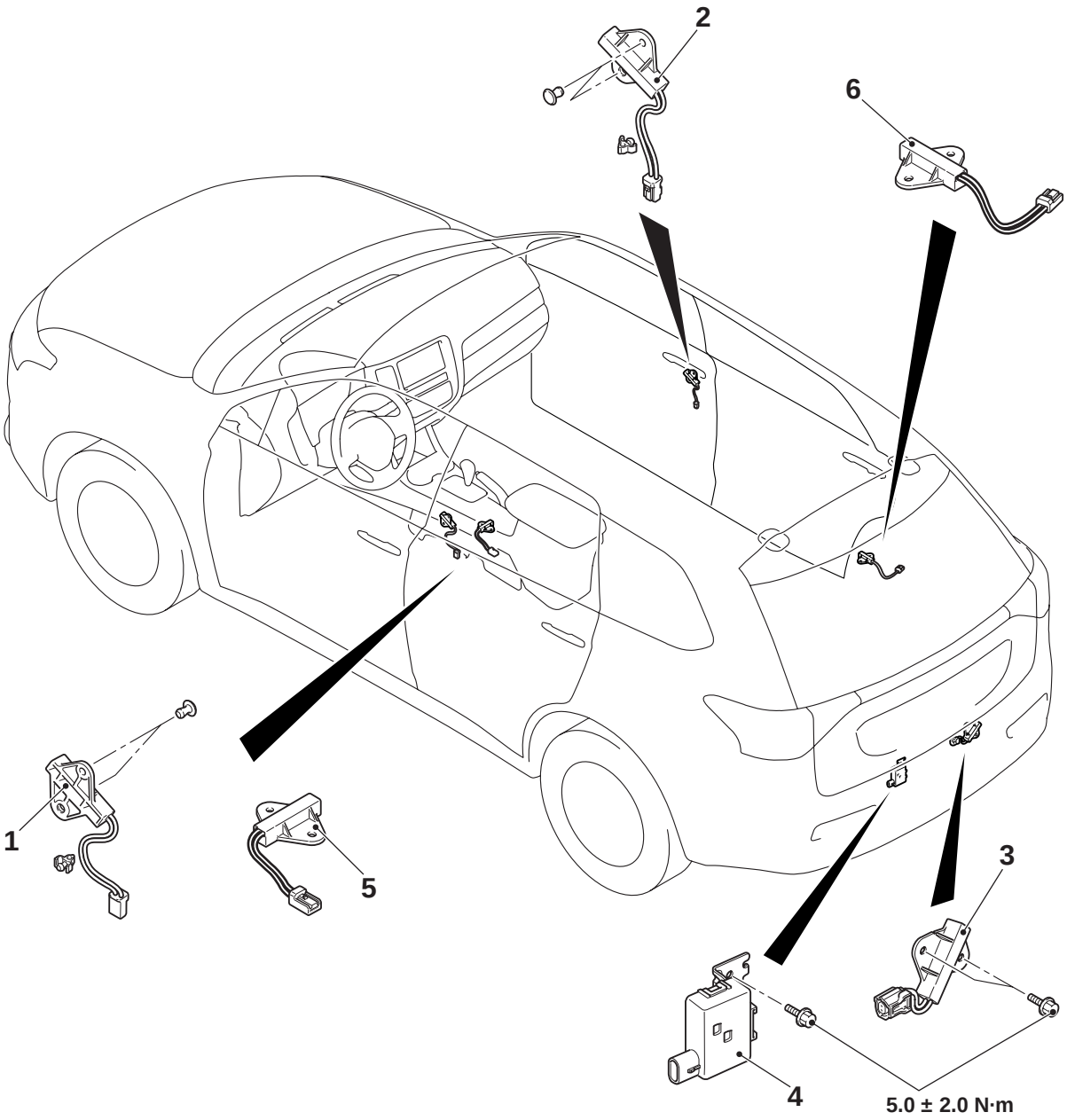
- OSS-ECU (Refer to P.42B-100.)

1. KOS-ECU

OUTSIDE TRANSMISSION ANTENNA ASSEMBLY, INSIDE TRANSMISSION ANTENNA ASSEMBLY

REMOVAL AND INSTALLATION

M1429619300099



ACB05641AB

Outside transmission antenna assembly (driver's side) removal steps

- Centre pillar trim upper (LH) (Refer to GROUP 52A – Interior Trim .)

1. Outside transmission antenna assembly (driver's side)

Outside transmission antenna assembly (passenger's side) removal steps

- Centre pillar trim upper (RH) (Refer to GROUP 52A – Interior Trim .)

2. Outside transmission antenna assembly (passenger's side)

Outside transmission antenna assembly (tailgate) removal steps

- Rear bumper assembly (Refer to GROUP 51 – Rear Bumper Assembly).

3. Outside transmission antenna assembly (tailgate)

Buzzer removal steps

- Rear bumper assembly (Refer to GROUP 51 – Rear Bumper Assembly).

4. Buzzer

Inside transmission antenna assembly (front) removal steps

- Shift lever panel assembly (Refer to GROUP 52A – Front Floor Console Assembly .)

5. Inside transmission antenna assembly (front)

Inside transmission antenna assembly (rear) removal steps

- Quarter trim tray (Refer to GROUP 52A – Interior Trim .)

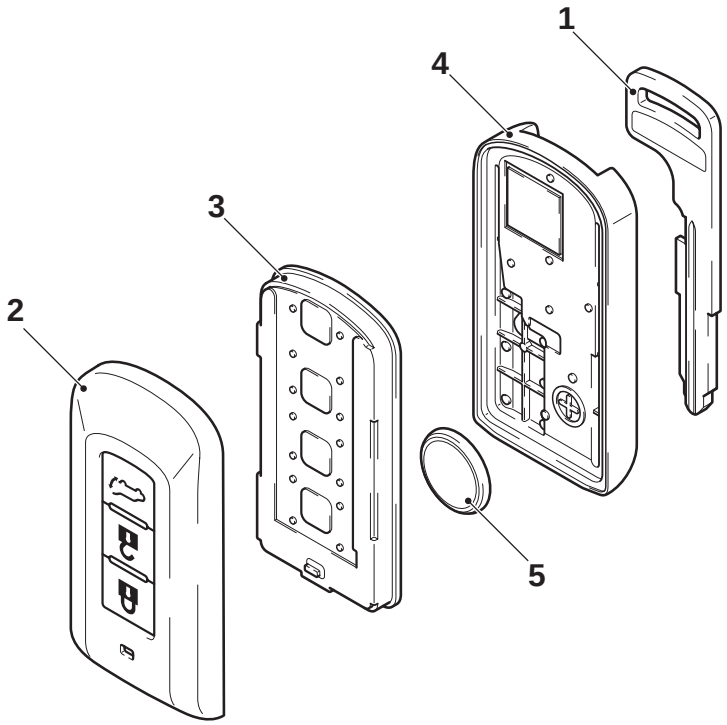
6. Inside transmission antenna assembly (rear)

KEYLESS OPERATION KEY

DISASSEMBLY AND REASSEMBLY

M1429604000285

Post-installation operation
Operation check of the keyless operation key

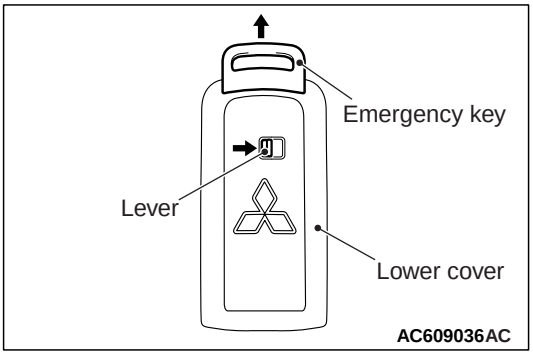


AC702707AD

			Disassembly steps
<<**A**>>		1.	Emergency key
<<**B**>>		2.	Upper cover
<<**B**>>		3.	Transmitter assembly
<<**B**>>	>>**A**<<	4.	Battery
<<**B**>>		5.	Lower cover

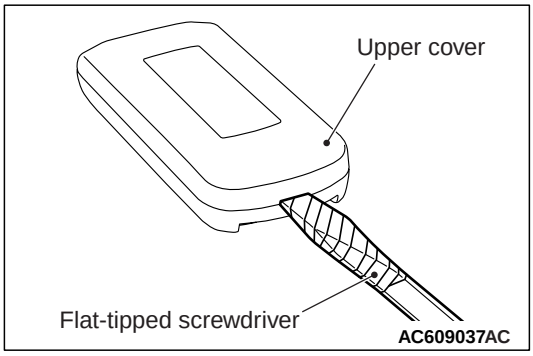
DISASSEMBLY SERVICE POINTS

<<A>> EMERGENCY KEY REMOVAL



Move the lever on the lower cover to the direction shown by the arrow to remove the emergency key from the keyless operation key.

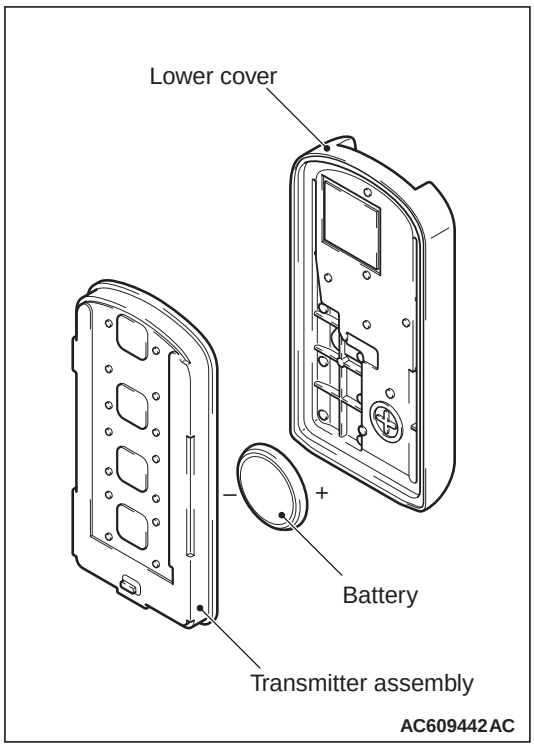
<<B>> UPPER COVER/TRANSMITTER ASSEMBLY/BATTERY/LOWER COVER REMOVAL



Set a flat-tipped screwdriver wrapped with protective tape as shown in the figure, and pry off the keyless operation key.

REASSEMBLY SERVICE POINT

>>A<< BATTERY INSTALLATION



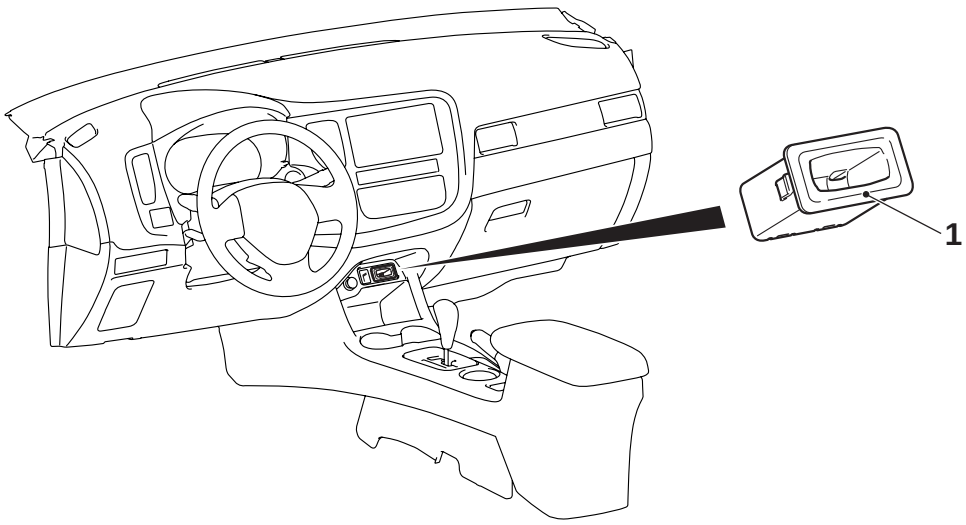
Install a battery with the positive side facing toward the lower cover.

Replacement battery: Coin-type lithium battery CR2032

KEY SLOT

REMOVAL AND INSTALLATION

M1429620700035



Removal steps

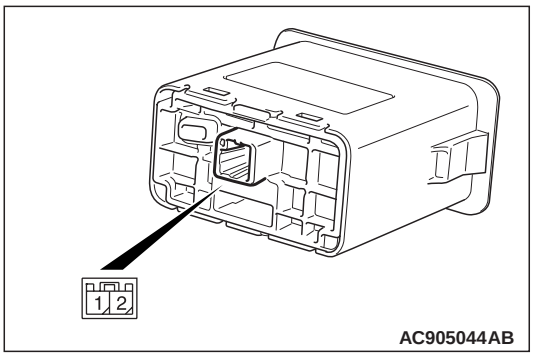
- Centre lower box assembly (Refer to GROUP 52A – Instrument panel assembly .)

1. Key slot

INSPECTION

M1429620800032

KEY SLOT INSPECTION



Terminal number	Normal value
1 – 2	12 ± 4 Ω

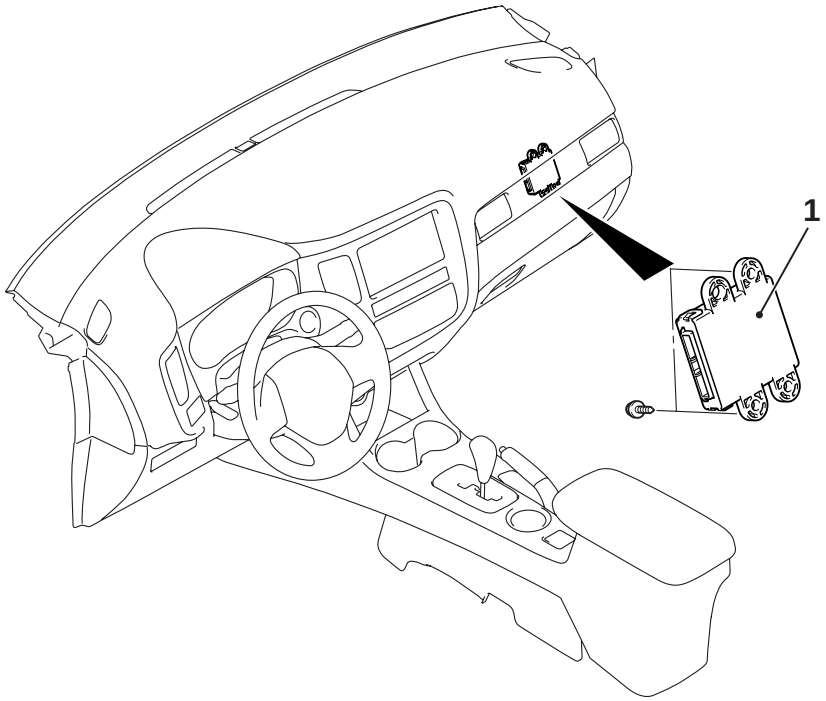
OSS-ECU

REMOVAL AND INSTALLATION

M1429625900034

⚠ CAUTION

When the OSS-ECU is replaced, be sure to complete the registration of chassis number. (Refer to P.42B-93.)



Removal steps

- Upper glove box assembly (Refer to GROUP 52A – Instrument panel assembly .)

>>**A**<< 1. OSS-ECU

INSTALLATION SERVICE POINT

>>A<< OSS-ECU INSTALLATION

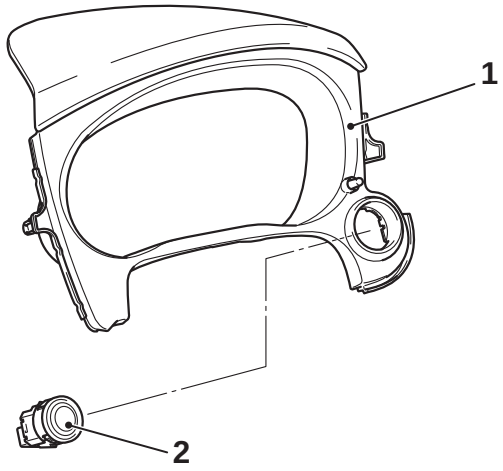
When the OSS-ECU is replaced, the mode is shifted to the special operation mode, and the system works as follows:

- When the engine switch is pressed, the power supply mode of the vehicle changes without key certification.
- The lock/unlock control of the electric steering lock is not performed.
- The engine cannot be started.
- While turning the vehicle power on, the LED of the engine switch flashes in green.
- After the OSS-related devices including OSS-ECU are registered and engine start is possible, the special operation mode will be cancelled automatically by operating the engine switch.
- Check that the special operation mode cancellation is completed by checking the diagnosis code, by checking whether the engine switch LED is flashing or not, and by checking whether the engine can be started or not.

ENGINE SWITCH

REMOVAL AND INSTALLATION

M1429625600033



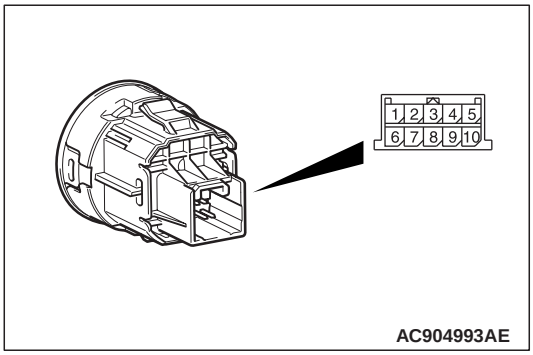
ACB05708AB

Removal steps

1. Combination meter bezel (Refer to GROUP 54A – Combination meter .)
2. Engine switch

INSPECTION

M1429625700041



Switch operation	Terminal number	Normal value
Press	6 – 2	Continuity exists (2 Ω or less)
	10 – 4	

Switch operation	Terminal number	Normal value
Release	6 – 2	No continuity
	10 – 4	

ELECTRIC STEERING LOCK

REMOVAL AND INSTALLATION

M1429628100015

⚠ CAUTION

When the electric steering lock is replaced, be sure to complete the registration of chassis number.(Refer to P.42B-93.)

Refer to GROUP 37 – Disassembly and Assembly of Steering Shaft .