

GROUP 54Ag

IGNITION SWITCH

CONTENTS

SPECIAL TOOLS.....54Ag-2

DIAGNOSIS.....54Ag-3

STANDARD FLOW OF DIAGNOSTIC
TROUBLESHOOTING.....54Ag-3

DIAGNOSTIC FUNCTION.....54Ag-3

TROUBLE SYMPTOM CHART.....54Ag-5

SYMPTOM PROCEDURES.....54Ag-5

Ignition key cylinder illumination
light does not illuminate/extinguish
normally. <vehicles with WCM>
.....54Ag-5

Ignition key cylinder illumination
light does not illuminate/extinguish
normally. <vehicles with KOS>
.....54Ag-9

ON-VEHICLE SERVICE.....54Ag-13

CHECK OF IGNITION KEY REMINDER
WARNING FUNCTION (STEERING LOCK
REMINDER TONE ALARM BY KOS)
.....54Ag-13

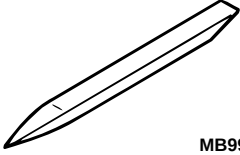
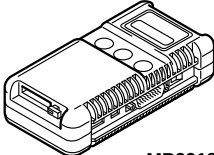
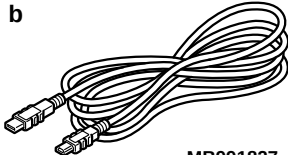
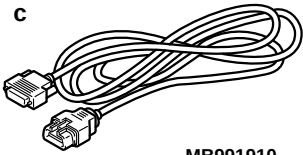
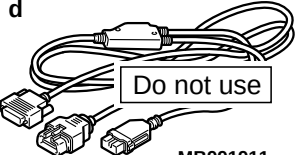
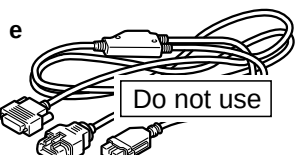
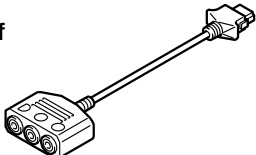
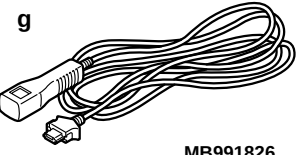
REMOVAL AND INSTALLATION.....54Ag-13

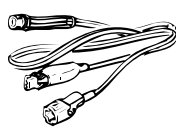
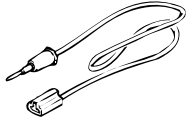
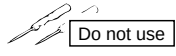
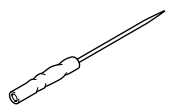
INSPECTION.....54Ag-15

INSPECTION.....54Ag-15

SPECIAL TOOLS

M15410000002USA0000010000

Tool	Tool number and name	Supersession	Application
 MB990784	MB990784 Ornament remover	General service tool	Removal of steering column cover and lower panel
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 YB9919580000	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Daimler Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT <i>NOTE: G: MB991826 M. U. T. -III Trigger Harness is not necessary when pushing V. C. I. ENTER key.</i>	⚠ CAUTION M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle. Diagnostic code, service data and actuator test check.

Tool	Tool number and name	Supersession	Application
a  b  c  d  YB9912230000	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adaptor d. Probe	General service tools	Continuity check and voltage measurement at harness wire or connector a. Connector pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection
 MB992006	MB992006 Extra fine probe	-	Continuity check and voltage measurement at harness wire or connector.

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

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

M15410000004USA0000010000

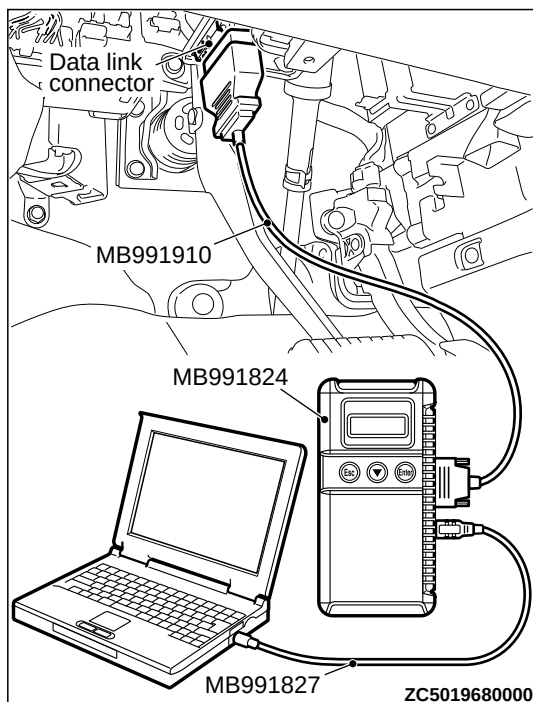
DIAGNOSTIC FUNCTION

M154100000020USA0000010000

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

Required Special Tools:

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

**⚠ CAUTION**

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

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

NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.

7. Start the M.U.T.-III system on the personal computer.

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

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES**Required Special Tools:**

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

⚠ CAUTION

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

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

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System select" from the start-up screen.
4. Select "From 2006 MY" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "ETACS" from "System List", and press the "OK" button.

NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.

6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to erase the DTC.

HOW TO DIAGNOSE THE CAN BUS LINES

Required Special Tools:

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

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

TROUBLE SYMPTOM CHART

M15410000005USA0000010000

Trouble symptom		Reference page
Ignition key cylinder illumination light does not illuminate/extinguish normally.	vehicles with WCM	P.54Ag-5
	vehicles with KOS	P.54Ag-9

SYMPTOM PROCEDURES

Ignition key cylinder illumination light does not illuminate/extinguish normally.
<vehicles with WCM>

M15410000018USA0000010000

CAUTION

Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

ETACS-ECU
C-315

MU801890

	1			2	
3	4			5	6
7	8	9	10	11	12
13	14	15	16	17	18

KEY
REMINDER
SWITCH
(WHEN
REMOVING
KEY: ON**)**

C-211

1	2	3		4	5
6	7	8	9	10	11

WHITE 18

5

RED- WHITE 13

3

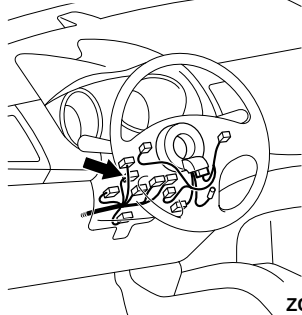
IGNITION KEY CYLINDER ILLUMINATION LIGHT

ON OFF

BLACK 7

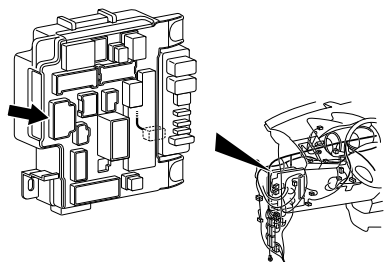
BLACK 2

Connector: C-211



ZC6008770002

Connector: C-315



ZC6008780008

The ETACS-ECU operates this function in accordance with the input signals below.

- ### TECHNICAL DESCRIPTION (COMMENT)

If this function does not work normally, these input signal circuit(s), the ignition key cylinder illumination light or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- The key reminder switch may be defective
- The driver's door switch may be defective
- The ignition key cylinder illumination light bulb may be defective
- The ETACS-ECU may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS

Required Special Tools:

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

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

CAUTION

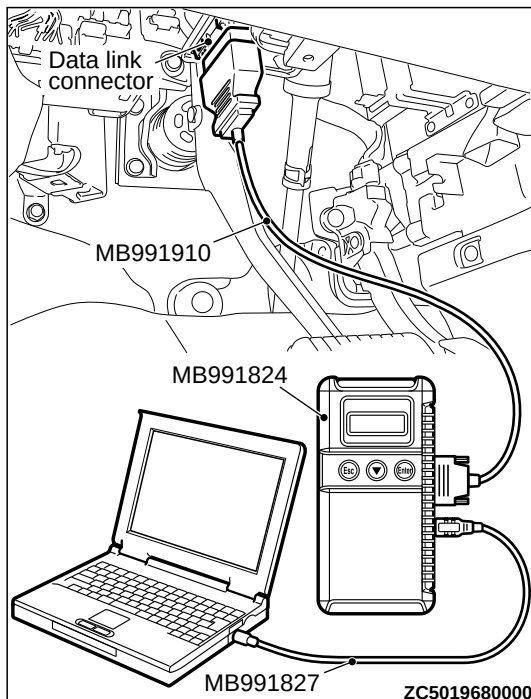
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

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

Q:Is the DTC set?

YES: Diagnose the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis P.54Ad-8.

NO: Go to Step 2.



STEP 2. Using scan tool MB991958, check data list.

Use the ETACS-ECU data list to check the signals related to the ignition key cylinder illumination light function.

- Turn the ignition switch to the "LOCK" (OFF) position.
- Remove the ignition key from the ignition key cylinder.
- Open the driver's door.

Item No.	Item name	Normal conditions
Item 228	Dr door unlock	ON
Item 254	Dr door ajar switch	0 V
Item 256	Dr door ajar switch	ON

Item No.	Item name	Normal conditions
Item 264	Handle lock switch	Key in → Key out

Q:Does scan tool MB991958 display the items "Dr door unlock", "Dr door ajar switch", and "Handle lock switch" as normal condition?

YES<Normal conditions are displayed for all the items.>: Go to Step 3.

NO<Normal condition is not displayed for item No.

228.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 4 "ETACS-ECU does not receive any signal from the front door lock actuator" P. 54Ad-67.

NO<Normal condition is not displayed for item No.

254.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 2 "ETACS-ECU does not receive any signal from the ignition switch (IG1)" P. 54Ad-62.

NO<Normal condition is not displayed for item No.

256.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 6 "ETACS-ECU does not receive any signal from the front the front door switch (RH)" P. 54Ad-75.

NO<Normal condition is not displayed for item No.

264.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 3 "ETACS-ECU does not receive any signal from key reminder switch" P. 54Ad-64.

STEP 3. Check key reminder switch connector C-211, ETACS-ECU connector C-315 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is key reminder switch connector C-211, ETACS-ECU connector C-315 in good condition?

YES: Go to Step 4.

NO: Repair the damaged parts.

STEP 4. Check the Wiring harness between key reminder switch connector C-211 (terminal No. 3,5) and ETACS-ECU connector C-315 (terminal No. 13,18).

* Check the input/output line for open circuit.

Q:Is the check result normal?

YES: Go to Step 5.

NO: Repair the wiring harness between key reminder switch connector C-211 and ETACS-ECU connector C-315.

STEP 5. Check of ignition key cylinder illumination light bulb.

Q:Is the ignition key cylinder illumination light bulb in good condition?

YES: Go to Step 6.

NO: Replace the bulb of the ignition key cylinder illumination light.

STEP 6. Retest the system.

Q: Does the ignition key cylinder illumination light illuminate/extinguish in good condition?

YES: The trouble can be an intermittent malfunction (Refer to GROUP 00, How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P. 00-15).

NO: Replace the ETACS-ECU.

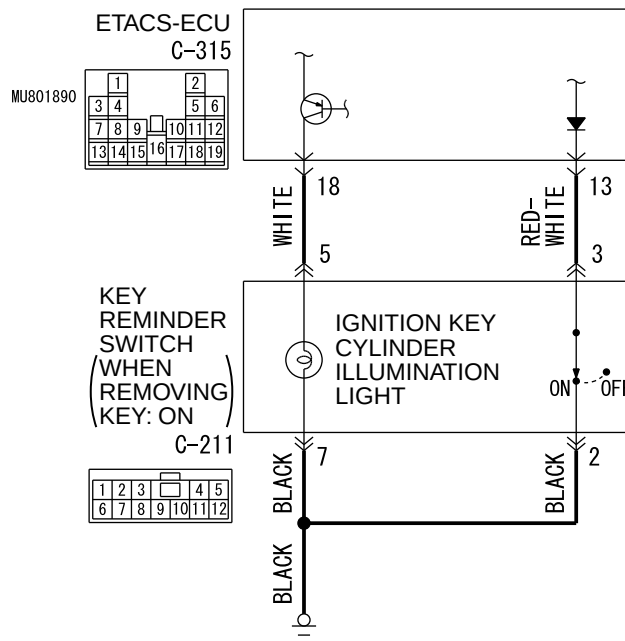
**Ignition key cylinder illumination light does not illuminate/extinguish normally.
<vehicles with KOS>**

M15410000019USA0000010000

CAUTION

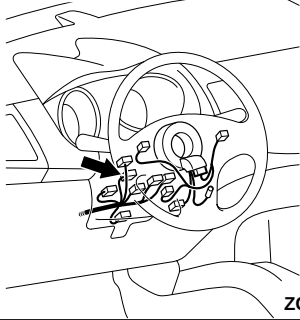
Whenever the ECU is replaced, ensure that the input and output signal circuits are normal.

Ignition Key Cylinder Illumination Light Circuit



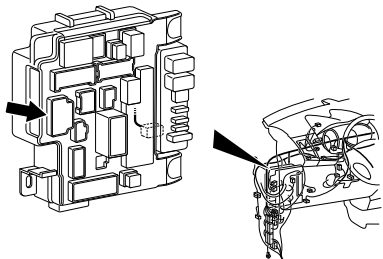
D7G54M026A00

Connector: C-211



ZC6008770002

Connector: C-315



ZC6008780008

OPERATION

The ETACS-ECU operates this function in accordance with the input signals below.

- Ignition switch (IG1)
- Key reminder switch
- Steering lock (CAN information)
- Driver's door switch

TECHNICAL DESCRIPTION (COMMENT)

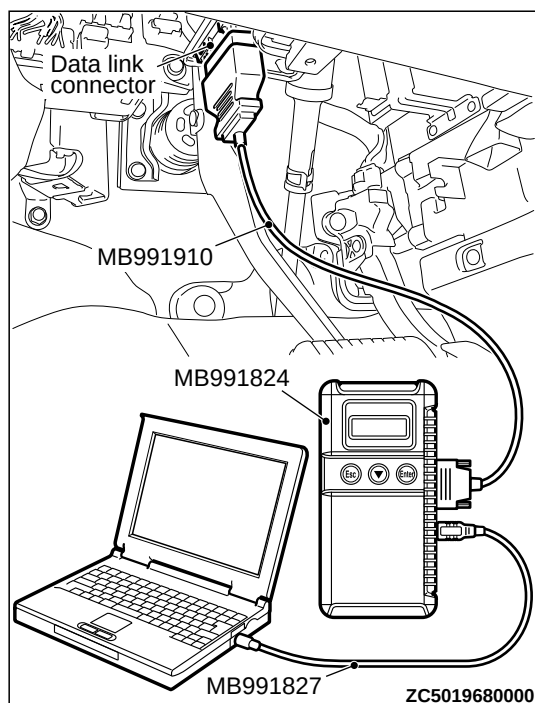
If this function does not work normally, these input signal circuit(s), the ignition key cylinder illumination light or the ETACS-ECU may be defective.

TROUBLESHOOTING HINTS

- CAN bus line may be defective
- The key reminder switch may be defective
- The driver's door switch may be defective
- The ignition key cylinder illumination light bulb may be defective
- The ETACS-ECU may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS**Required Special Tools:**

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



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

⚠ CAUTION

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

- (1) Connect scan tool MB991958. Refer to "How to connect the scan tool (M.U.T.-III) P.54Af-4."
- (2) Turn the ignition switch to the "ON" position.
- (3) Diagnose the CAN bus line.
- (4) Turn the ignition switch to the "LOCK" (OFF) position.

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

YES: Go to Step 2.

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

STEP 2. Using scan tool MB991958, check for any diagnostic trouble code.

Check if DTC is set to the KOS-ECU <vehicles with KOS> or WCM <vehicles with WCM>.

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

Q: Is the DTC set?

YES<vehicles with KOS>: Troubleshoot the KOS (Refer to GROUP 42B, KOS P. 42B-18).

YES<vehicles with WCM>: Troubleshoot the WCM (Refer to GROUP 42C, WCM P. 42C-11).

NO: Go to Step 3.

STEP 3. Using scan tool MB991958, check data list.

Use the ETACS-ECU data list to check the signals related to the ignition key cylinder illumination light function.

- Turn the ignition switch to the "LOCK" (OFF) position.
- Remove the ignition key from the ignition key cylinder.
- Open the driver's door.

Item No.	Item name	Normal conditions
Item 228	Dr door unlock	ON
Item 254	IG voltage	0 V
Item 256	Dr door ajar switch	ON
Item 264	Handle lock switch	Key in → Key out

Q:Does scan tool MB991958 display the items "Dr door unlock", "Dr door ajar switch", and "Handle lock switch" as normal condition?

YES<Normal conditions are displayed for all the items.>: Go to Step 4.

NO<Normal condition is not displayed for item No.

228.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 4 "ETACS-ECU does not receive any signal from the front door lock actuator" P. 54Ad-67.

NO<Normal condition is not displayed for item No.

254.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 2 "ETACS-ECU does not receive any signal from the ignition switch (IG1)" P. 54Ad-62.

NO<Normal condition is not displayed for item No.

256.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 6 "ETACS-ECU does not receive any signal from the front the front door switch (RH)" P. 54Ad-75.

NO<Normal condition is not displayed for item No.

264.>: Troubleshoot the ETACS-ECU. Refer to GROUP 54Ad, Diagnosis - Inspection Procedure 3 "ETACS-ECU does not receive any signal from key reminder switch" P. 54Ad-64.

STEP 4. Check key reminder switch connector C-211, ETACS-ECU connector C-315 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q:Is key reminder switch connector C-211, ETACS-ECU connector C-315 in good condition?

YES: Go to Step 5.

NO: Repair the damaged parts.

STEP 5. Check the Wiring harness between key reminder switch connector C-211 (terminal No. 3,5) and ETACS-ECU connector C-315 (terminal No. 13,18).

*Check the input/output line for open circuit.

Q:Is the check result normal?

YES: Go to Step 6.

NO: Repair the wiring harness between key reminder switch connector C-211 and ETACS-ECU connector C-315.

STEP 6. Check of ignition key cylinder illumination light bulb.

Q:Is the ignition key cylinder illumination light bulb in good condition?

YES: Go to Step 7.

NO: Replace the bulb of the ignition key cylinder illumination light.

STEP 7. Retest the system.

Q:Does the ignition key cylinder illumination light illuminate/extinguish in good condition?

YES: The trouble can be an intermittent malfunction
(Refer to GROUP 00, How to use Troubleshooting/inspection
Service Points – How to Cope with Intermittent
Malfunction P.00-15).

NO: Replace the ETACS-ECU.

ON-VEHICLE SERVICE

**CHECK OF IGNITION KEY REMINDER WARNING
FUNCTION (STEERING LOCK REMINDER TONE
ALARM BY KOS)**

M15410000010USA0000010000

1. Driver's door: Release the closed and steering wheel lock, or turn the ignition key vehicles with WCM or emergency key vehicles with KOS to the "LOCK" (OFF) position (key inserted).
2. Change the driver's door state from closed to open.
3. Check that the tone alarm sounds normally.
4. If a malfunction is found, carry out the troubleshooting (Refer to GROUP 54Ab, Combination Meter - Trouble Symptom Chart P.54Ab-40).

REMOVAL AND INSTALLATION

M15410000011USA0000010000

⚠ CAUTION

To remove the driver airbag module, refer to
**GROUP 52B - Service Precautions P.52B-28and
Air Bag Module(s) and Clock Spring P.52B-329.**

Pre-removal Operation

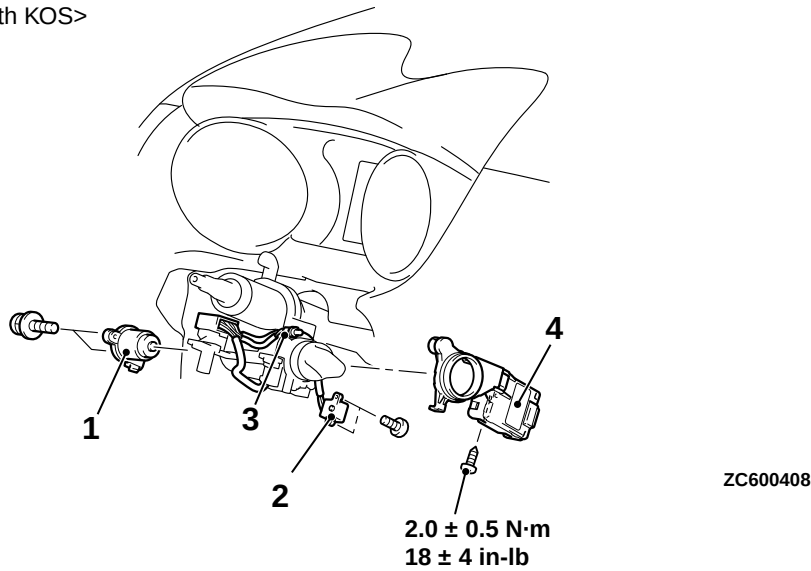
- Removal of lower panel and steering column cover (Refer to GROUP 52A - Instrument Panel Assembly P.52A-2.)
- Removal of clock spring/column switch assembly (Refer to GROUP 37 - Steering Shaft P.37-23and GROUP 52B - Air Bag Module(s) and Clock Spring P.52B-329.)

Post-installation Operation

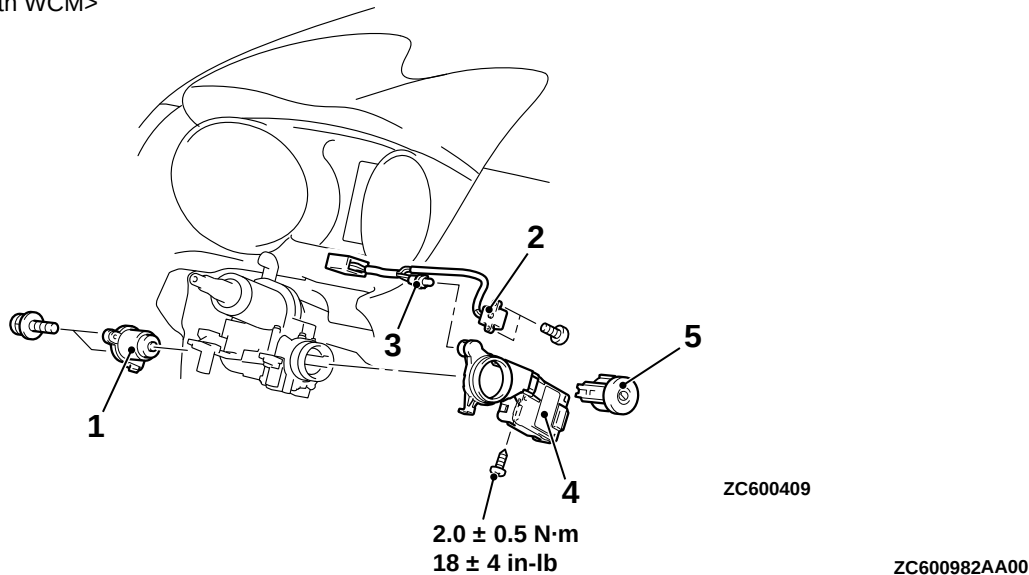
- Installation of clock spring/column switch assembly (Refer to GROUP 37 - Steering Shaft P.37-23and GROUP 52B - Air Bag Module(s) and Clock Spring P.52B-329.)
- Installation of lower panel and steering column cover (Refer to GROUP 52A - Instrument Panel Assembly P.52A-2.)

IGNITION SWITCH
REMOVAL AND INSTALLATION

<Vehicles with KOS>



<Vehicles with WCM>



Removal Steps

1. Ignition switch
2. Key reminder switch
3. Key ring illumination light
4. WCM <vehicles with WCM>/receiver antenna module <vehicles with KOS>

<<A>>

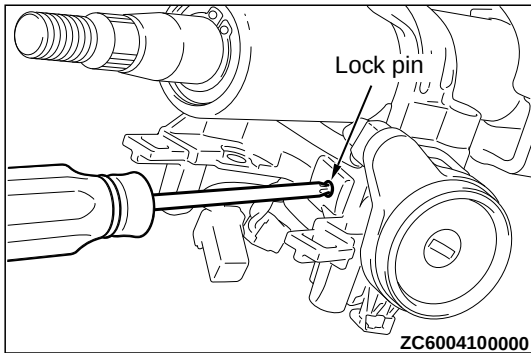
Removal Steps

5. Steering lock cylinder <vehicles with WCM>

REMOVAL SERVICE POINT

<<A>> STEERING LOCK CYLINDER REMOVAL <VEHICLES WITH WCM>

1. Insert the key into the steering lock cylinder, and turn the ignition key to the "ACC" position.

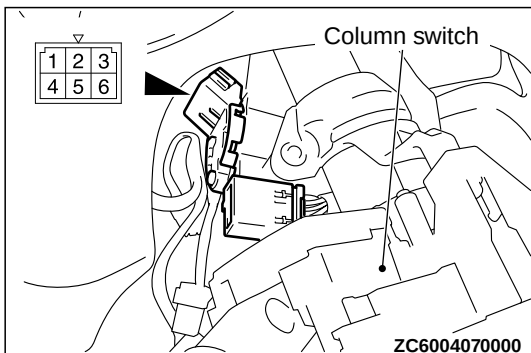


2. With using a cross-headed screw driver (small) or similar items to press in the lock pin, remove the ignition key, and then remove the steering lock cylinder.

INSPECTION

INSPECTION

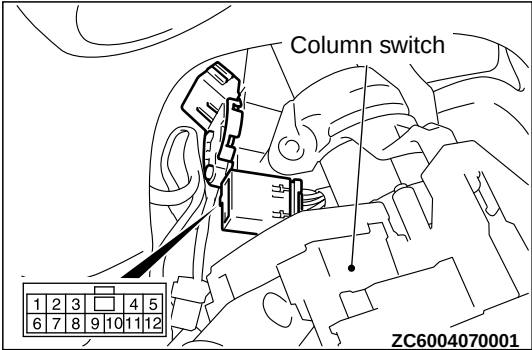
M15410000013USA0000010000



IGNITION SWITCH CONTINUITY CHECK

With the ignition switch mounted to the vehicle, disconnect and check the ignition switch connection connector.

Ignition key position	Terminal number	Normal conditions
LOCK	1 - 2, 1 - 4, 1 - 5, 1 - 6	No continuity
ACC	1 - 6	Continuity exists (2 Ω or less)
ON	1 - 2 - 4 - 6	Continuity exists (2 Ω or less)
START	1 - 2 - 5	Continuity exists (2 Ω or less)



KEY REMINDER SWITCH CONTINUITY CHECK

With the key reminder switch mounted to the vehicle, disconnect the key reminder switch connection connector, and then perform the continuity check.

Key status	Terminal number	Normal conditions
Key removed	2 - 3	Continuity exists (2 Ω or less)
Key inserted	2 - 3	No continuity