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## POWER DOOR LOCK SYSTEM

### 1 ITC COMPUTER

#### 1-1 REMOVAL AND INSTALLATION

##### CAUTION

- Be careful not to drop the door control relay Ay or give great impacts to it.
- If the door control relay Ay dropped or was subjected to great impacts, replace it with a new one even if there is no abnormality in its external appearance.

##### 1-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (−) terminal.
2. Remove the instrument panel finish lower panel S/A.

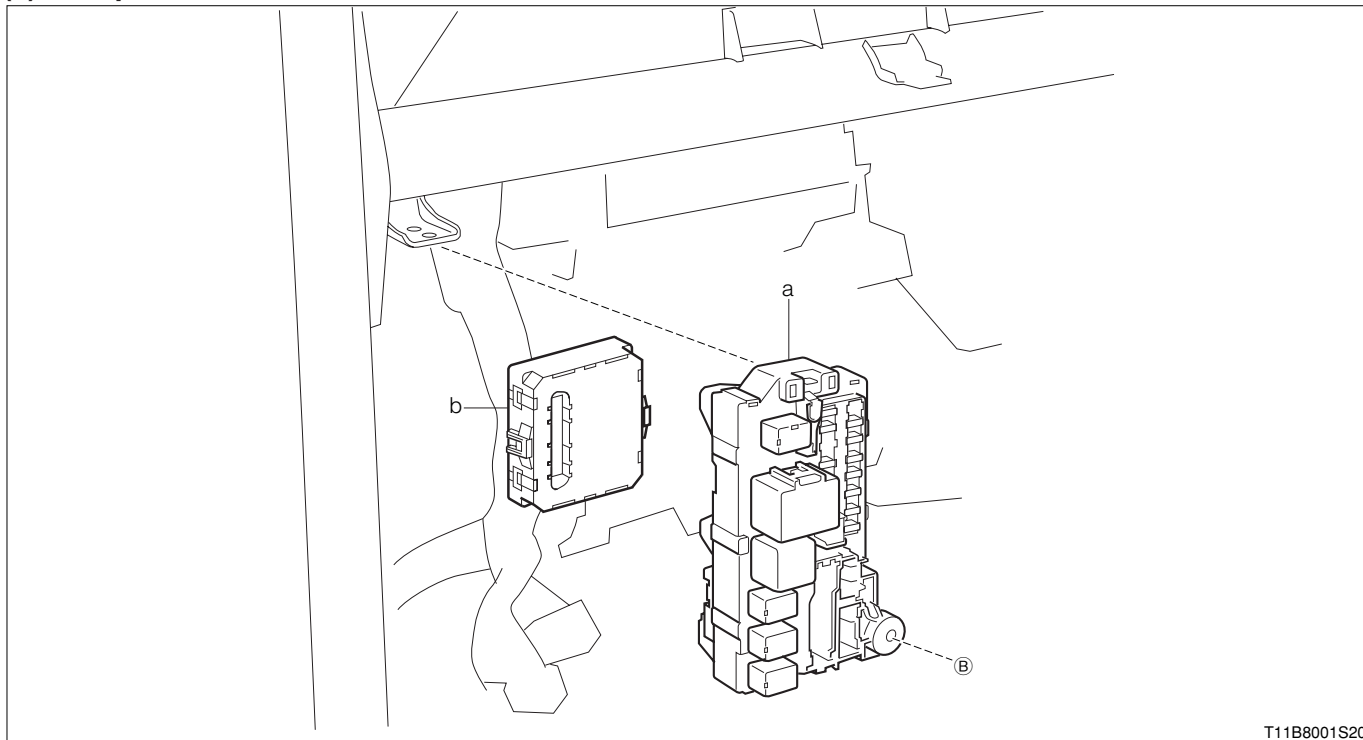
Refer to Page I2-23.

3. Remove the fuse box opening cover.

Refer to Page I2-23.

##### 1-1-2 REMOVAL AND INSTALLATION PROCEDURES

###### (1) Components



T11B8001S20

###### (2) Removal and installation procedures

- 1 a Block Ay, fuse W/fuse
- 2 b Relay Ay, door control

##### 1-1-3 INSPECTION

###### (1) Relay Ay, door control

1. Replace the computer with a new one in the following cases.
  - (1) Case where the door control relay Ay has deformation, abrasion, cracks or breakage.

##### CAUTION

- Never disassemble the computer.

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### **1-1-4 OPERATION AFTER INSTALLATION**

1. Install the fuse box opening cover.  
Refer to Page I2-23.
2. Install the instrument panel finish lower panel S/A.  
Refer to Page I2-23.
3. Connect the battery negative (–) terminal.

## **2 FRONT DOOR LOCK MOTOR**

### **2-1 REMOVAL AND INSTALLATION**

Refer to Page I1-13.

## **3 REAR DOOR LOCK MOTOR**

### **3-1 REMOVAL AND INSTALLATION**

Refer to Page I1-20.

## **4 BACK DOOR LOCK MOTOR**


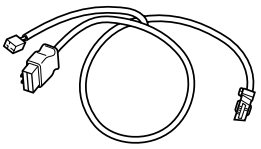
### **4-1 REMOVAL AND INSTALLATION**

Refer to Page I1-22.

## 5 POWER DOOR LOCK SYSTEM

### 5-1 ARTICLES TO BE PREPARED

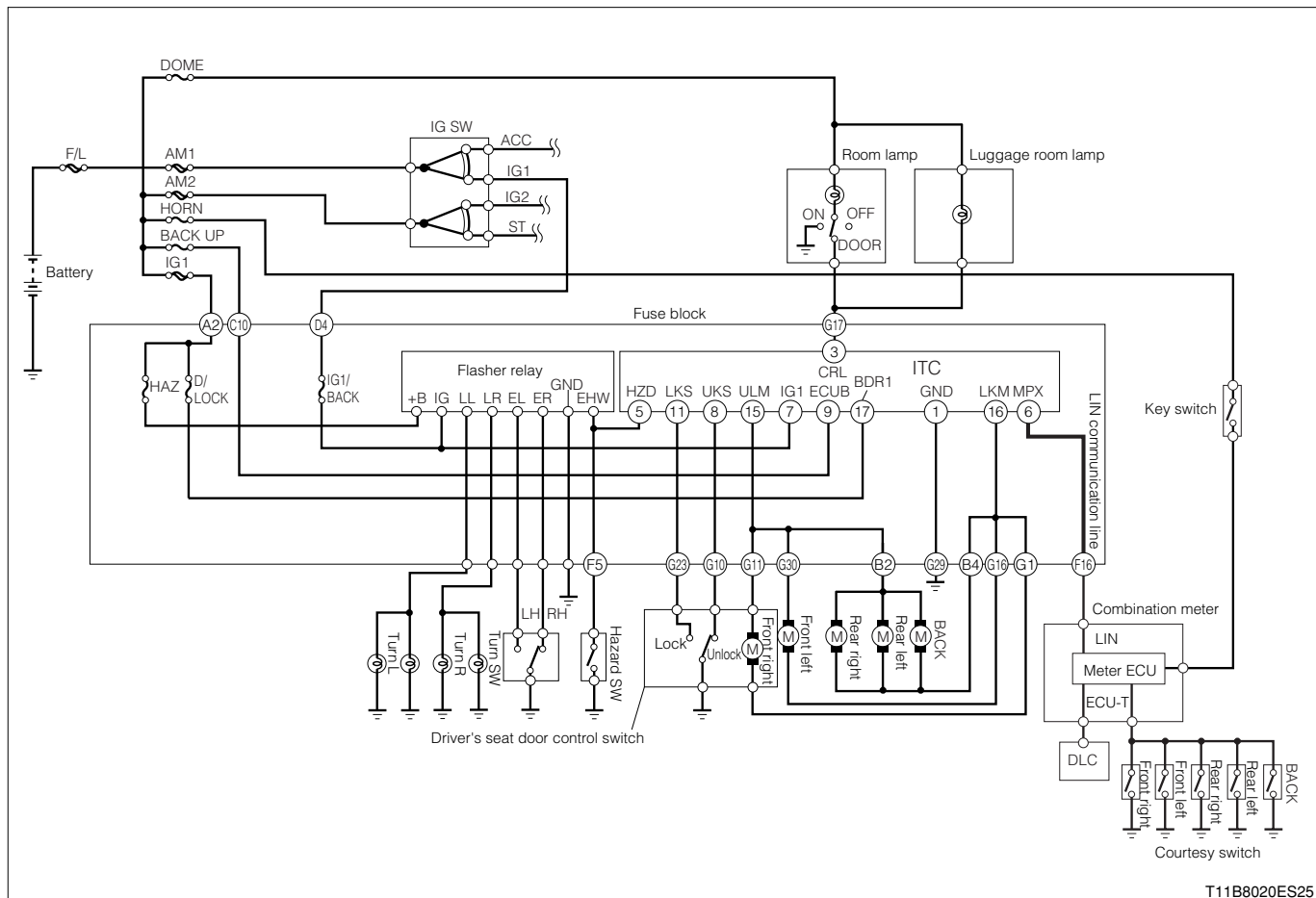
SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection

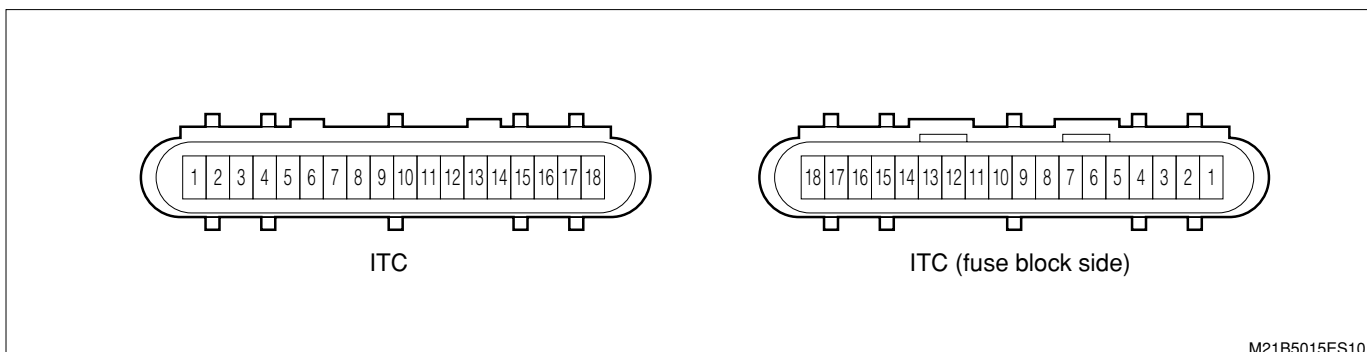
Instrument

Voltage tester, Oscillo scope

### 5-2 SYSTEM WIRING DIAGRAM



### 5-3 ARRANGEMENT OF ECU TERMINAL

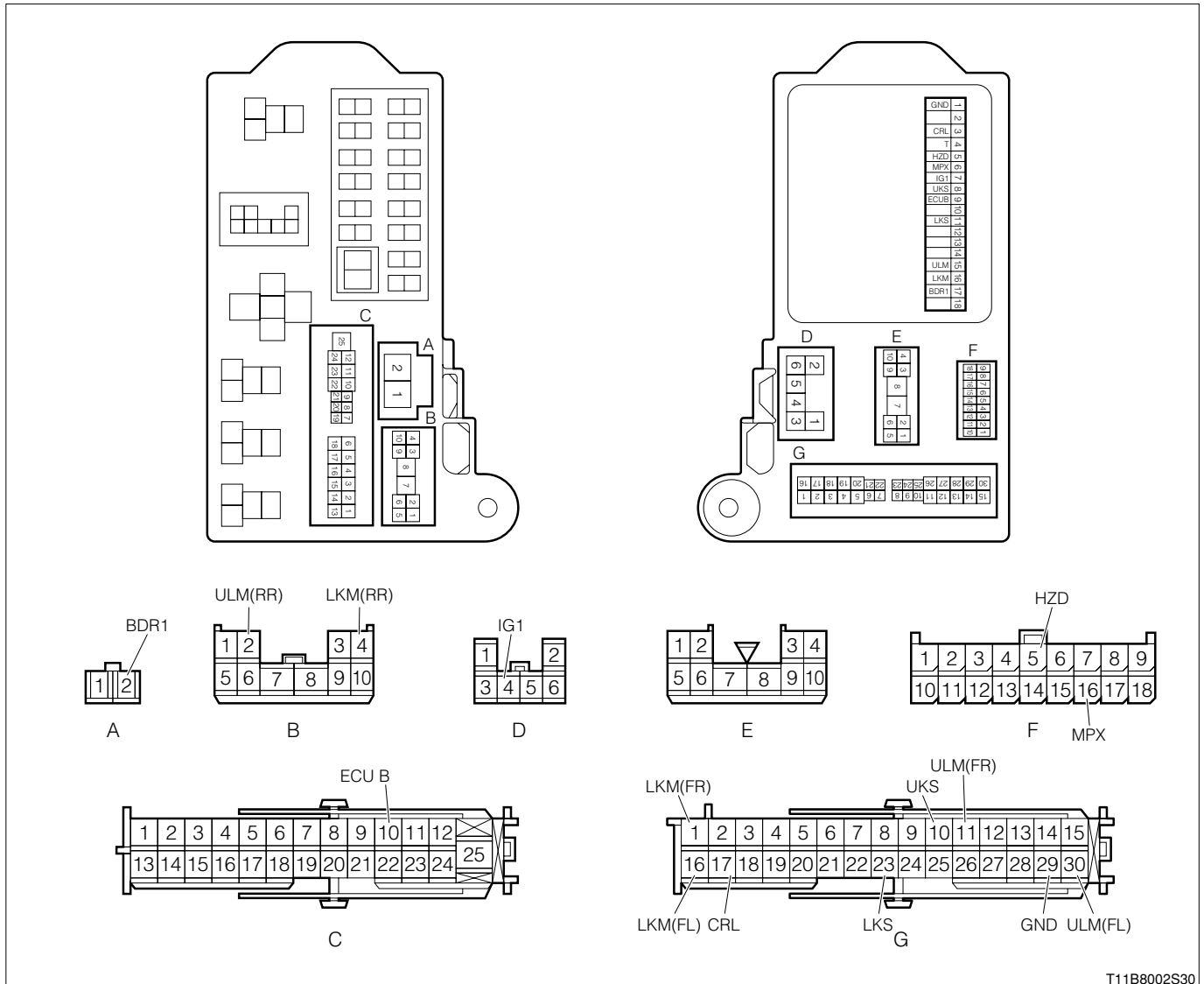


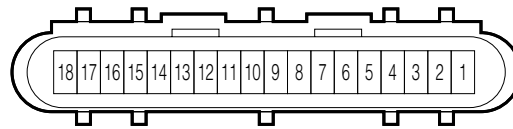
Body integrated controller (ITC) terminal name

Terminal No.	Terminal code	Terminal name
1	GND	Earth
2	—	—
3	CRL	Room lamp driving output
4	—	—
5	HZD	Hazard lamp driving output
6	MPX	LIN communication input/output
7	IG1	ECU power supply
8	UKS	Door control unlock side switch input
9	ECU B	ECU power supply
10	—	—
11	LKS	Door control lock side switch input
12	—	—
13	—	—
14	—	—
15	ULM	Door lock motor unlock side output
16	LKM	Door lock motor lock side output
17	BDR1	Power supply
18	—	—

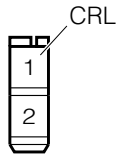
5-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Fuse block

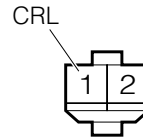




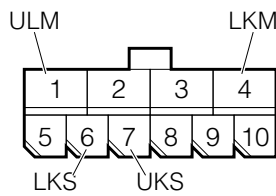
ITC (fuse block side)



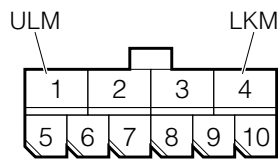
Room lamp



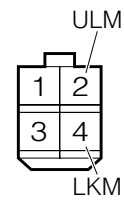
Luggage room lamp



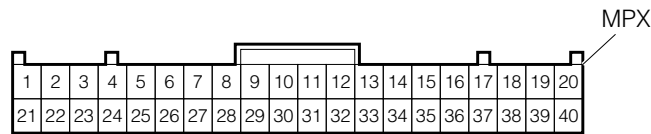
Driver's seat door control switch  
Driver's seat door lock motor



Front passenger seat door lock motor  
Rear seat door lock motor

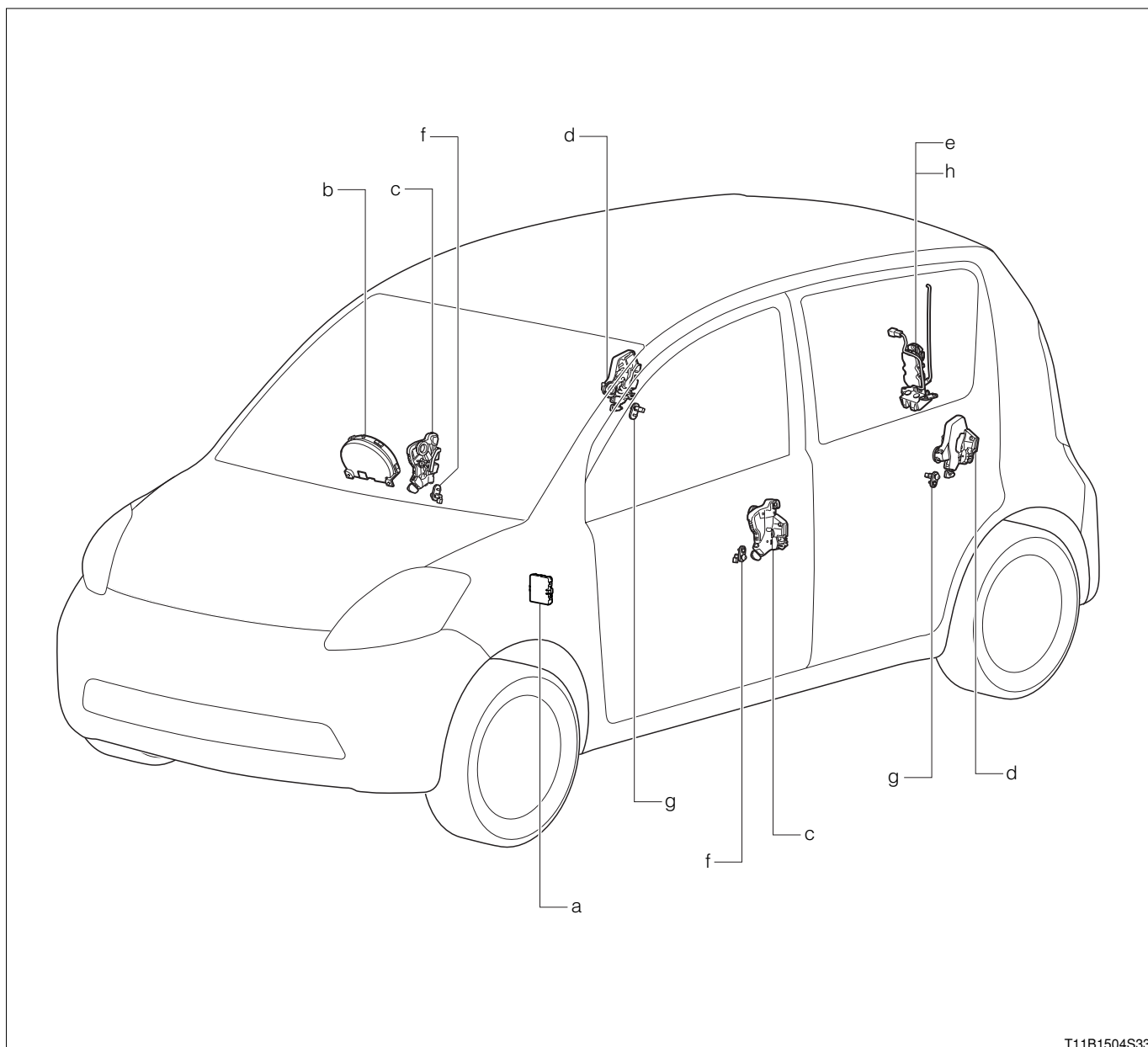


Back door lock motor



Combination meter

## 5-5 LOCATION OF COMPONENTS



T11B1504S33

a	Body integrated controller (ITC)
b	Meter ECU
c	Front door lock motor
d	Rear door lock motor
e	Back door lock motor
f	Front door courtesy switch
g	Rear door courtesy switch

## 5-6 HOW TO PROCEED WITH TROUBLE SHOOTING

### 5-6-1 INQUIRY

1. In your attempt to remove the causes for a malfunction of the vehicle, you will not be able to remove the causes unless you actually confirm the malfunctioning phenomenon. No matter how long you continue operations, the vehicle may not resume the normal state unless you confirm the malfunctioning phenomenon. The inquiry with the customer is a vital information collecting activity which is to be conducted previous to the confirmation of malfunctioning phenomenon.
2. This inquiry will provide you with an important clue in an effort to reproduce the malfunctioning phenomenon. Furthermore, the information obtained by the inquiry can be referred to during the troubleshooting. Hence, instead of making general questions, it is necessary to focus your questions on the items related to the malfunction.

### (1) DIAGNOSIS BY INTERVIEW SHEET FOR POWER DOOR LOCK SYSTEM

Checked by		Check date	Day	Month
			(day of week)	

#### Customer information

Name of customer	Mr./Ms.	Gender of customer (Male, female)	Age [approx. ]	Occupation [ ]	
		Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others	Parking place	Outdoor, indoor

#### Details of vehicle

Date when vehicle was brought to workshop	Day	Month	Date when malfunction took place	Day	Month	Repair history	No, Yes (How many times?)	
	(day of week)			(day of week)				
Frame No.			Registration date	Day	Month	Year	Vehicle model	
Engine type			Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T			Driving	2WD · 4WD
Running distance		km	Equipment	Tire [ ] · Wheel [Steel · Aluminum]				

#### Weather

<input type="checkbox"/> Fine	<input type="checkbox"/> Cloudy	<input type="checkbox"/> Rainy	<input type="checkbox"/> Snow	<input type="checkbox"/> Other( )
Temperature(Approx. )				

#### Frequency of malfunction

<input type="checkbox"/> Always	<input type="checkbox"/> Under certain condition( )	<input type="checkbox"/> Sometimes( )
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#### Phenomenon

<input type="checkbox"/> All doors are not locked interlocking with lock operation at driver's seat.
<input type="checkbox"/> Some doors are not locked interlocking with lock operation at driver's seat.
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/> Other



## 5-7 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

### 5-7-1 ALL DOORS ARE NOT LOCKED INTERLOCKING WITH LOCK OPERATION AT DRIVER'S SEAT.

#### ▷1. Power supply system check

1. Check the voltage A2 and C10 on the fuse block.

SPECIFIED VALUE: 10 – 14V

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, perform the following procedures.

2. Check the fuse (door lock) and the F/L for any defect .

3. Check the battery voltage.

4. Check that there are no abnormality such as open circuit in the harness of the power supply system.

#### ▷2. Earth system check

1. Check continuity between the fuse block G29 and the body earth.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷3.

▼ In the case of NG, repair the earth wire.

#### ▷3. Door control switch single unit check

1. Check the door control switch single unit on the driver's seat.

<RefCode=SI04\_0036>

▼ If it is OK, go to Step ▷4.

▼ In the case of NG, replace the door control switch.

#### ▷4. Wire harness check

1. Check continuity of the wire harness between the following terminals.

(1) Fuse block G10 – Door control switch terminal 7

(2) Fuse block G23 – Door control switch terminal 6

(3) Body earth – Door control switch terminal 8

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, repair the harness.

#### ▷5. Fuse block voltage check

1. Check the voltage between the following fuse block terminals when the door control switch is activated.

(1) Fuse block G16 – G30

(2) Fuse block G1 – G11

(3) Fuse block B4 – B2

SPECIFIED VALUE: 12 – 14V

▼ If it is OK, go to Step ▷7.

▼ In the case of NG, go to Step ▷6.

## ▷6. Fuse block check

1. Check the fuse block single unit.

▼ If it is OK, replace the ITC.

Refer to Page I4-1.

▼ In the case of NG, replace the fuse block.

## ▷7. Door lock motor single unit check

1. Check all the door lock motor single units.

Refer to Page I4-9.

▼ If it is OK, repair the harness between the fuse block and all doors.

▼ In the case of NG, replace the door lock motor.

## 5-7-2 SOME DOORS ARE NOT LOCKED INTERLOCKING WITH LOCK OPERATION AT DRIVER'S SEAT.

### ▷1. Fuse block voltage check

1. Check the voltage between the following fuse block terminals when the door control switch is activated.

(1) Fuse block G16 – G30

(2) Fuse block G1 – G11

(3) Fuse block B4 – B2

SPECIFIED VALUE: 10 – 14V

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, replace the fuse block.

### ▷2. Door lock motor single unit check

1. Check the door lock motor single units that are not functioning.

Refer to Page I4-9.

▼ If it is OK, repair the harness.

▼ In the case of NG, replace the door lock motor.

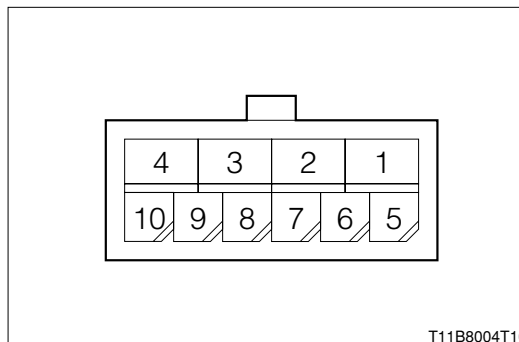
## 5-8 UNIT CHECK

### 5-8-1 FRONT DOOR CONTROL MOTOR, FR/RH

1. Check the door locking operation when the battery voltage is applied between the motor Ay terminals.

2. Check continuity between the terminals of the driver's seat door control switch.

OPERATION	Battery +	Battery –	Terminal No.	Standard
Lock	4	1	6–8	Continuity exists
Unlock	1	4	7–8	

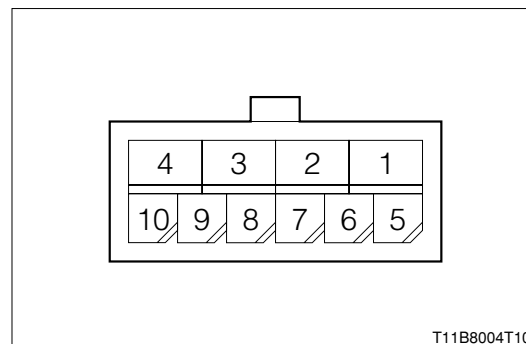


## 5-8-2 DOOR CONTROL MOTOR

### AY(FR/LH,RR/RH,RR/LH)

1. Check the door locking operation when the battery voltage is applied between the motor Ay terminals.

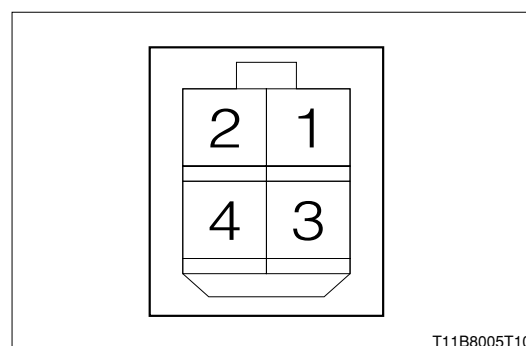
OPERATION	Battery +	Battery -
Lock	4	1
Unlock	1	4



## 5-8-3 BACK DOOR LOCK ACTUATOR AY

1. Check the door locking operation when the battery voltage is applied between the actuator Ay terminals.

OPERATION	Battery +	Battery -
Lock	4	2
Unlock	2	4



## 5-8-4 FUSE BLOCK

Remove the door control relay Ay from the fuse block and check continuity between each terminal of the fuse block and the ITC connector of the fuse block.

**SPECIFIED VALUE: Continuity exists.**

### FUSE BLOCK INSIDE CONTINUITY CHECK

ITC fuse block side terminal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Fuse block terminal	G29	-	G17	-	F5	F16	D4	G10	C10	-	G23	-	-	-	G11 G30 B2	G1G 16B 4	A2	-

## 5-9 ECU INPUT/OUTPUT SIGNAL CHECK

### 5-9-1 CHECKING METHOD

1. With the door control relay Ay installed to the fuse block, check that each terminal of the fuse block conforms to the following specified values given below.

## 5-9-2 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

Check system	Terminal	Condition	Specified value	Reference (example of measurement)
Power supply	A2(BDR1) – G29(GND) C10(ECU B) – G29(GND)	At all times	Battery voltage	12.8V
IG switch	D4(IG1) – G29(GND)	IG switch "OFF"	About 0V	0V
		IG switch "ON"	Battery voltage	12.5V
Room lamp	G17(CRL) – G29(GND)	All the doors "OPEN"	About 0V	0V
		All the doors "CLOSED"	Battery voltage	12.6V
Hazard lamp	F5(HZD) – G29(GND)	Hazard Lamp "Extinguished"	Battery voltage	12.7V
		Hazard lamp "Blinking"	About 0V	0V
Front door lock motor	G16(LKM) – G30(ULM) G1(LKM) – G11(ULM) B4(LKM) – B2(ULM)	When "LOCK" is selected on the door control switch.	Battery voltage	12 – 14V
	G30(ULM) – G16(LKM) G11(ULM) – G1(LKM) B2(ULM) – B4(LKM)	When "UNLOCK" is selected on the door control switch.	Battery voltage	12 – 14V
Door control switch	G23(LKS) – Body earth	When the door control switch is in "LOCK" position.	Continuity exists	Continuity exists
	G10(UKS) – Body earth	When the door control switch is in "UNLOCK" position.	Continuity exists	Continuity exists

## ■ KEY-LESS ENTRY SYSTEM

### 1 ITC COMPUTER

#### 1-1 REMOVAL AND INSTALLATION

Refer to Page I4-1.

### 2 DOOR CONTROL RECEIVER

#### 2-1 REMOVAL AND INSTALLATION

##### CAUTION

- Be careful not to drop the door control receiver or give great impacts to it.
- If the door control receiver dropped or was subjected to great impacts, replace it with a new one even if there is no abnormality in its external appearance.

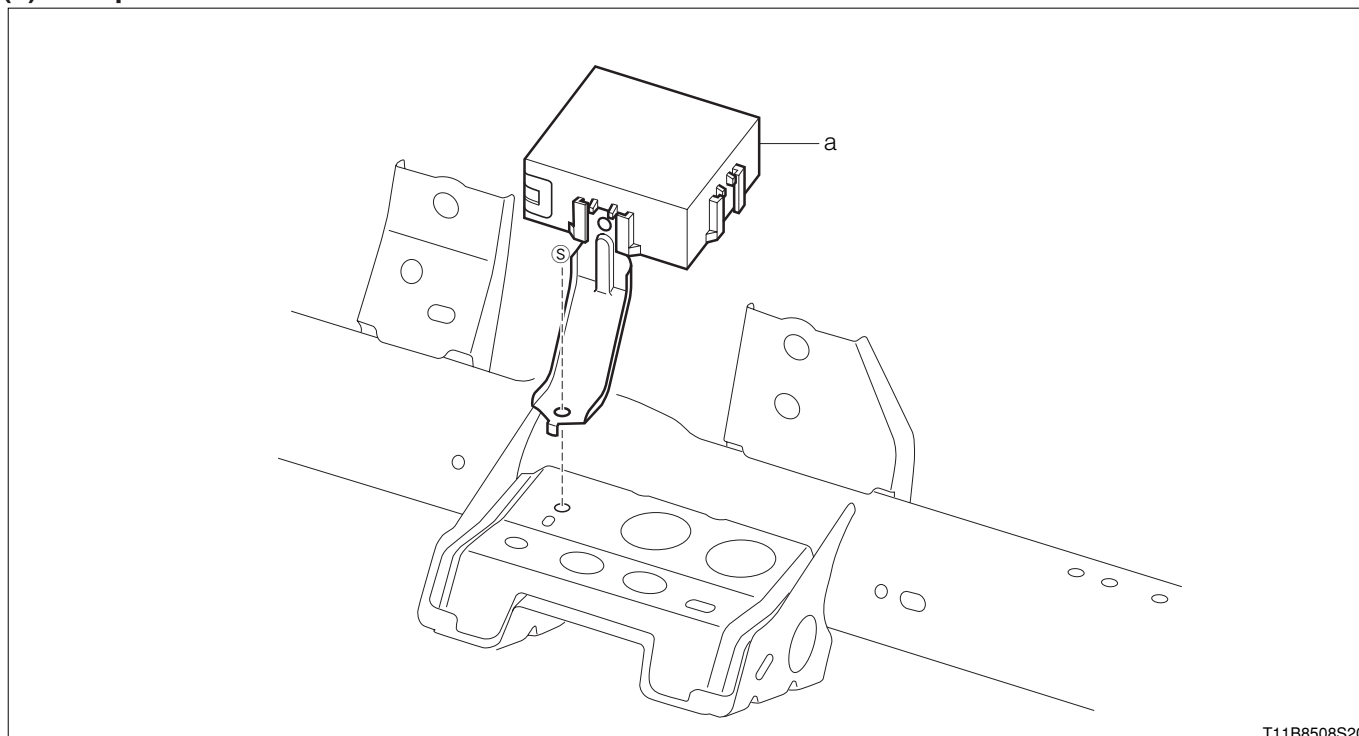
##### 2-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (–) terminal.
2. Remove the instrument cluster finish panel.

Refer to Page I2-23.

##### 2-1-2 REMOVAL AND INSTALLATION PROCEDURES

###### (1) Components



T11B8508S20

###### (2) Removal and installation procedures

- 1 a Receiver, door control

# I4-13

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## **2-1-3 OPERATION AFTER INSTALLATION**

1. Install the instrument cluster finish panel.  
Refer to Page I2-23.
2. Connect the battery negative (–) terminal.
3. Register the identification code (only when the receiver is to be replaced).  
Refer to Page I4-18.

## **3 FRONT DOOR LOCK MOTOR**

### **3-1 REMOVAL AND INSTALLATION**

Refer to Page I1-13.

## **4 REAR DOOR LOCK MOTOR**

### **4-1 REMOVAL AND INSTALLATION**

Refer to Page I1-20.

## **5 BACK DOOR LOCK MOTOR**

### **5-1 REMOVAL AND INSTALLATION**

Refer to Page I1-22.

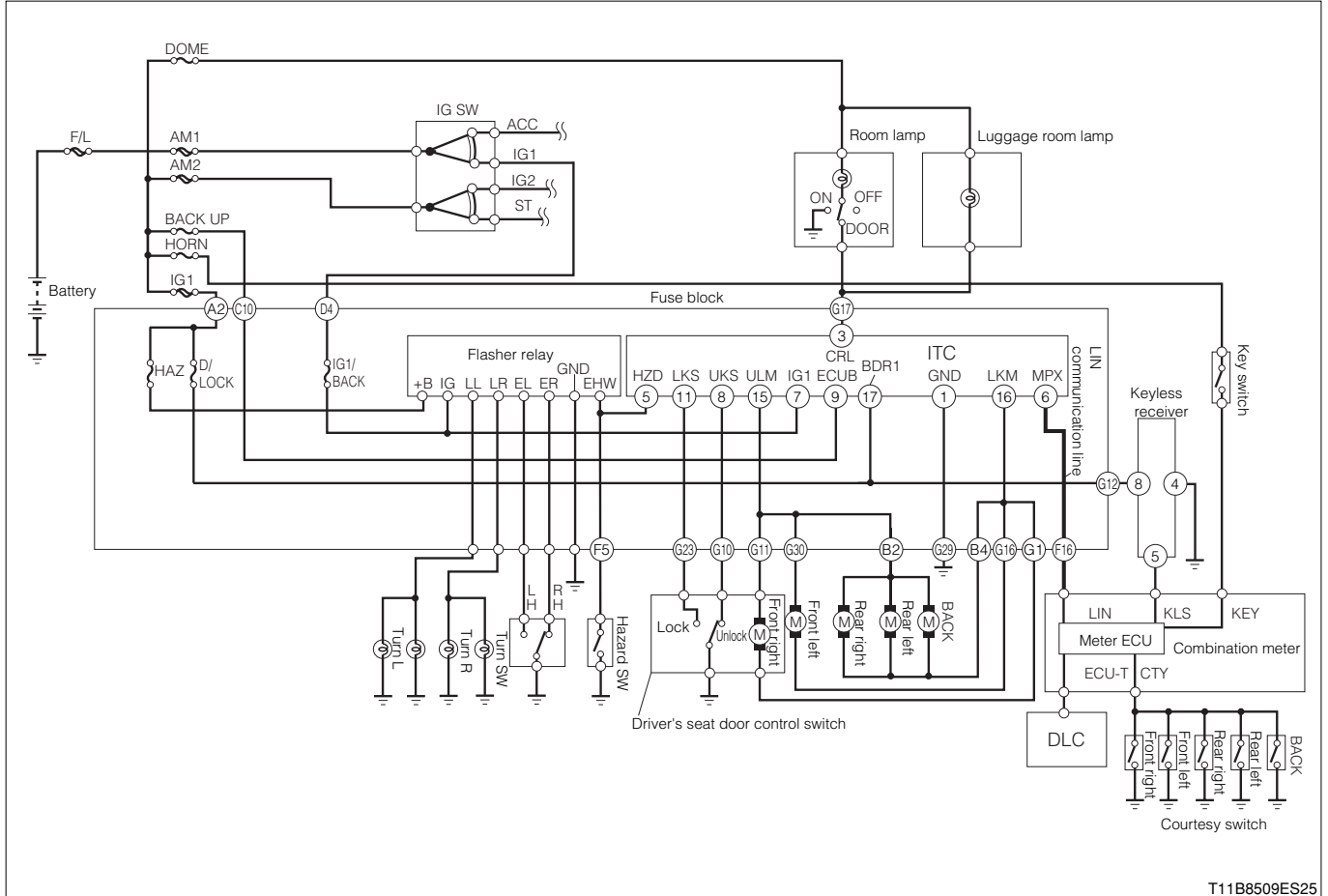
# 6 KEY-LESS ENTRY SYSTEM

## 6-1 ARTICLES TO BE PREPARED

Instrument

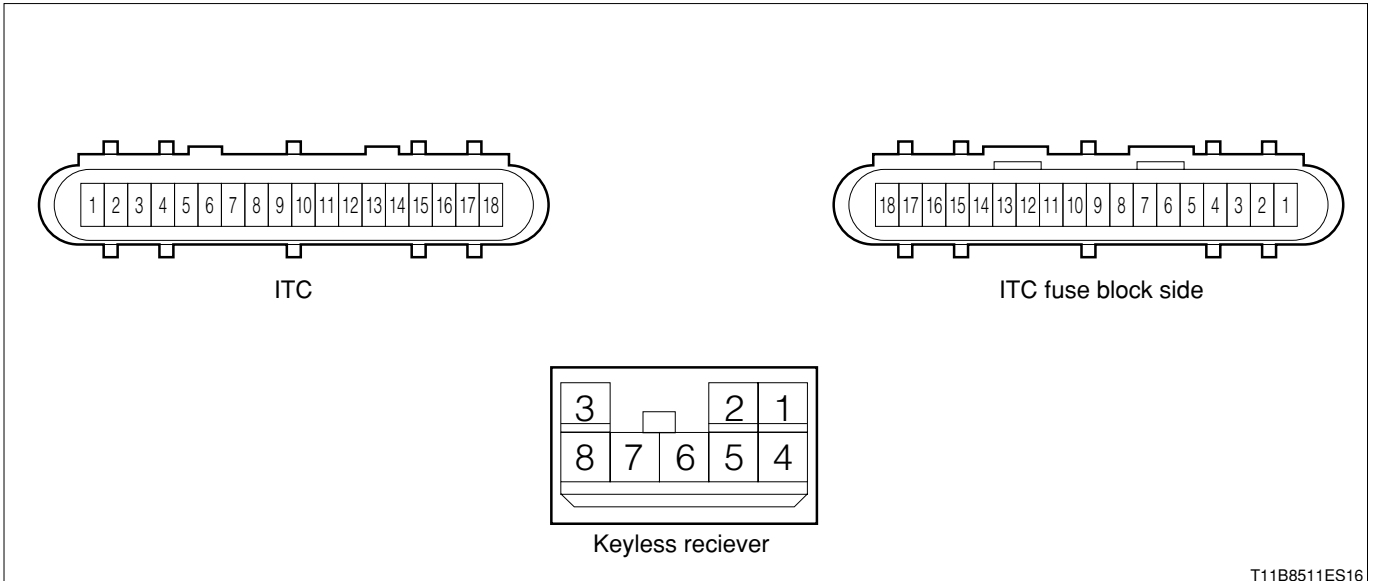
Voltage tester, Oscillo scope

## 6-2 SYSTEM WIRING DIAGRAM



T11B8509ES25

## 6-3 ARRANGEMENT OF ECU TERMINAL



T11B8511ES16

# I4-15

## Body integrated controller (ITC) terminal name

Terminal No.	Terminal code	Terminal name
1	GND	Earth
2	—	—
3	CRL	Room lamp driving output
4	—	—
5	HZD	Hazard lamp driving output
6	MPX	LIN communication input/output
7	IG1	ECU power supply
8	UKS	Door control unlock side switch input
9	ECU B	ECU power supply
10	—	—
11	LKS	Door control lock side switch input
12	—	—
13	—	—
14	—	—
15	ULM	Door lock motor unlock side output
16	LKM	Door lock motor lock side output
17	BDR1	Power supply
18	—	—

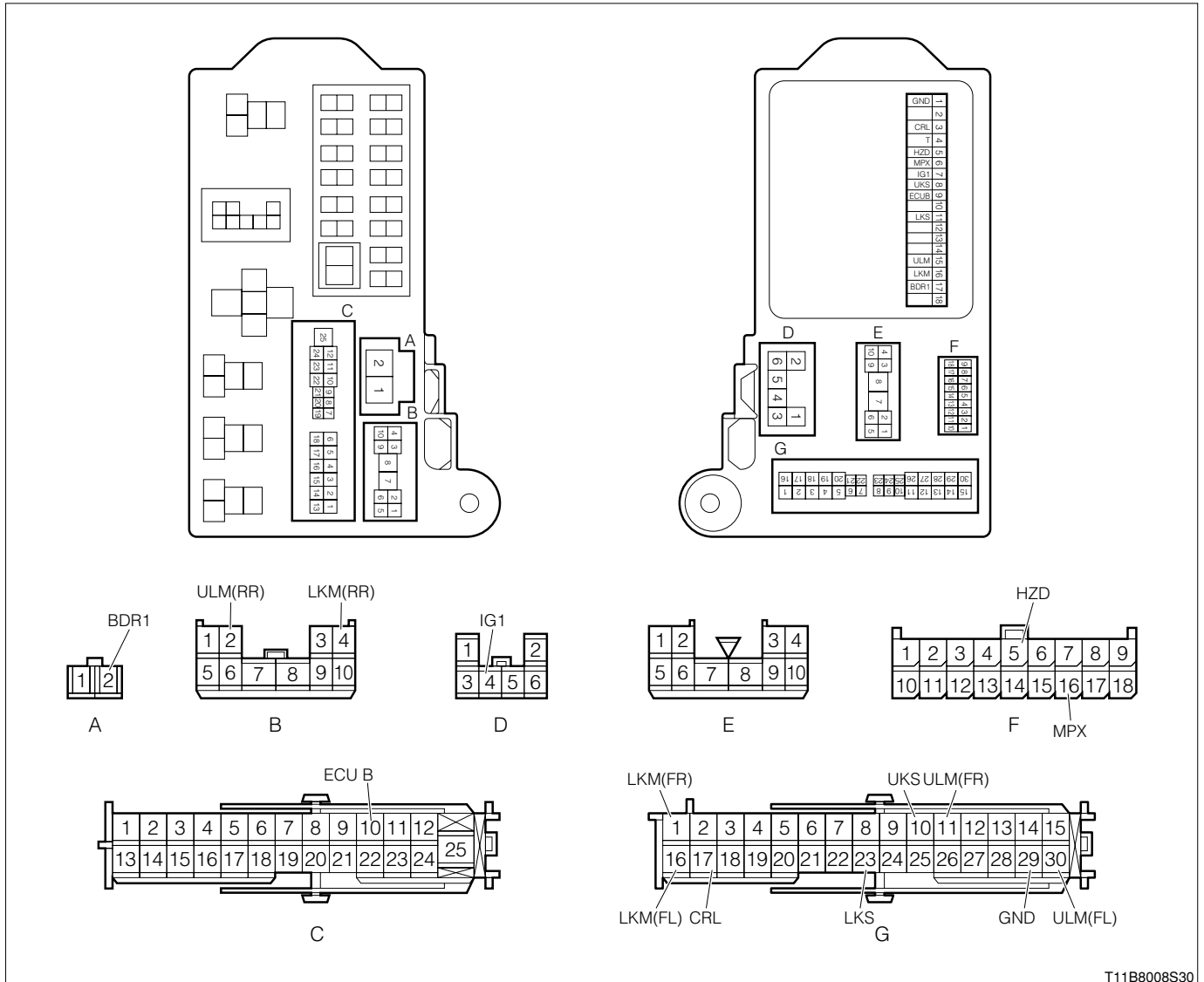
## Receiver connector terminal name

Terminal No.	Terminal code	Terminal name
1	—	—
2	—	—
3	—	—
4	GND	Earth
5	SIG	Keyless signal output
6	—	—
7	—	—
8	+B	Receiver power supply

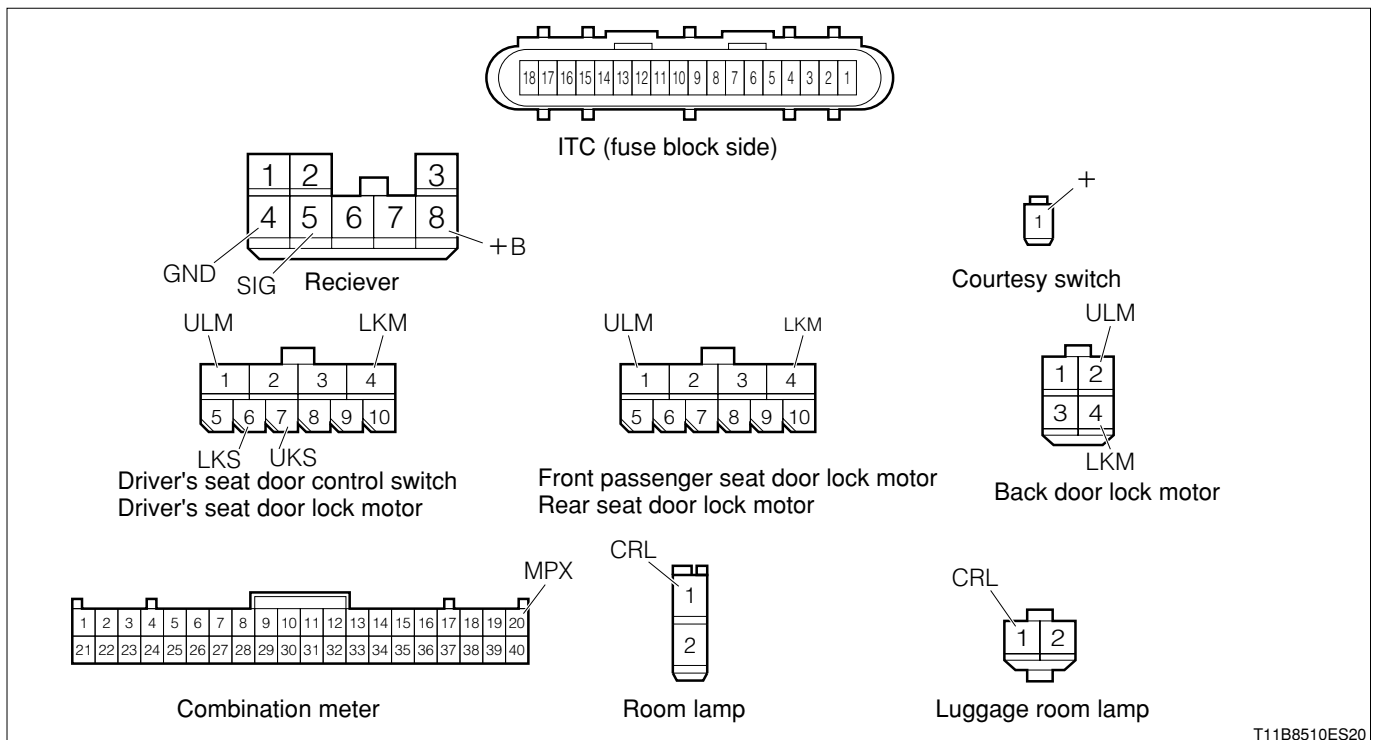


### 6-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Fuse block

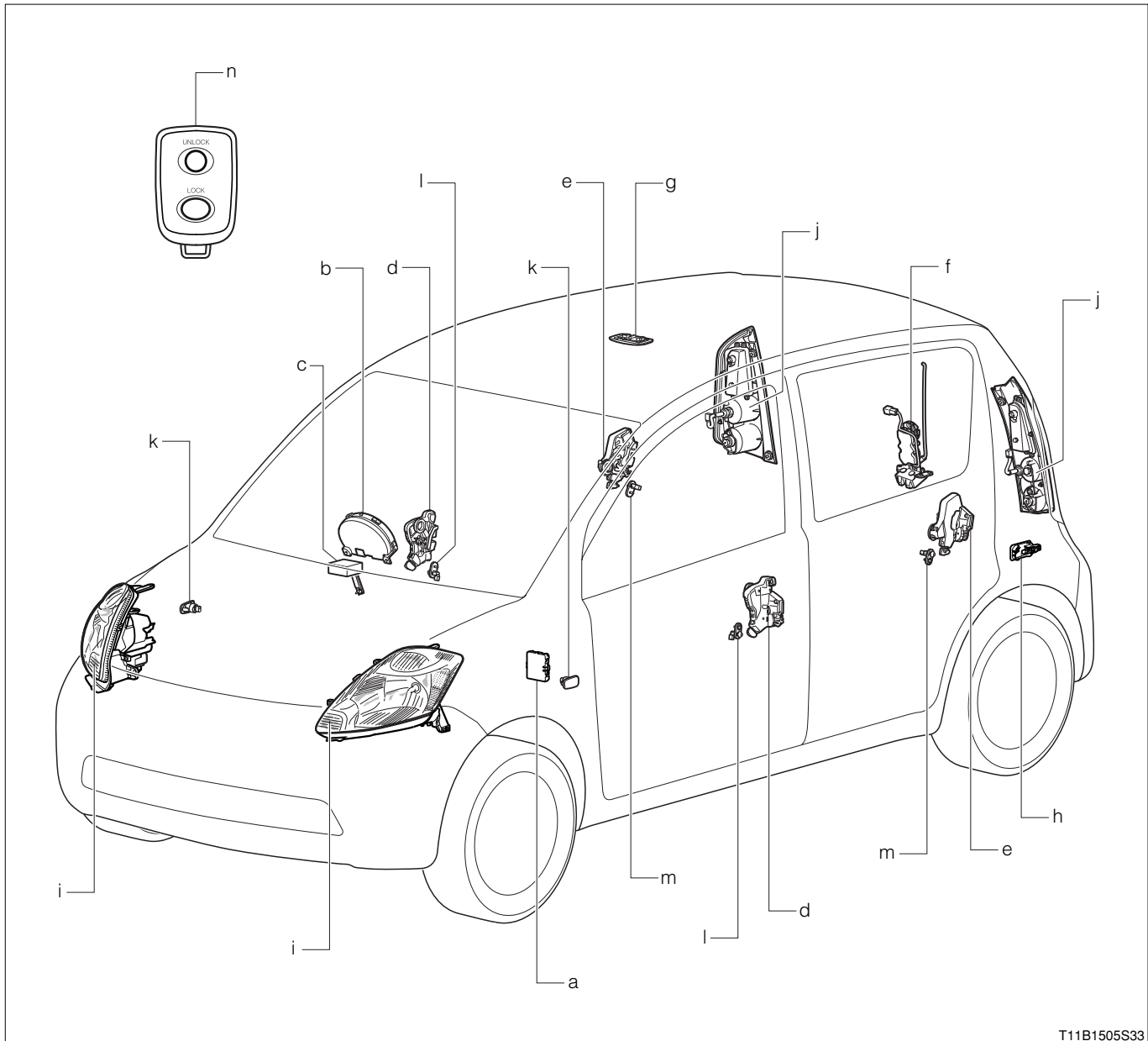


T11B8008S30



T11B8510ES20

## 6-5 LOCATION OF COMPONENTS



T11B1505S33

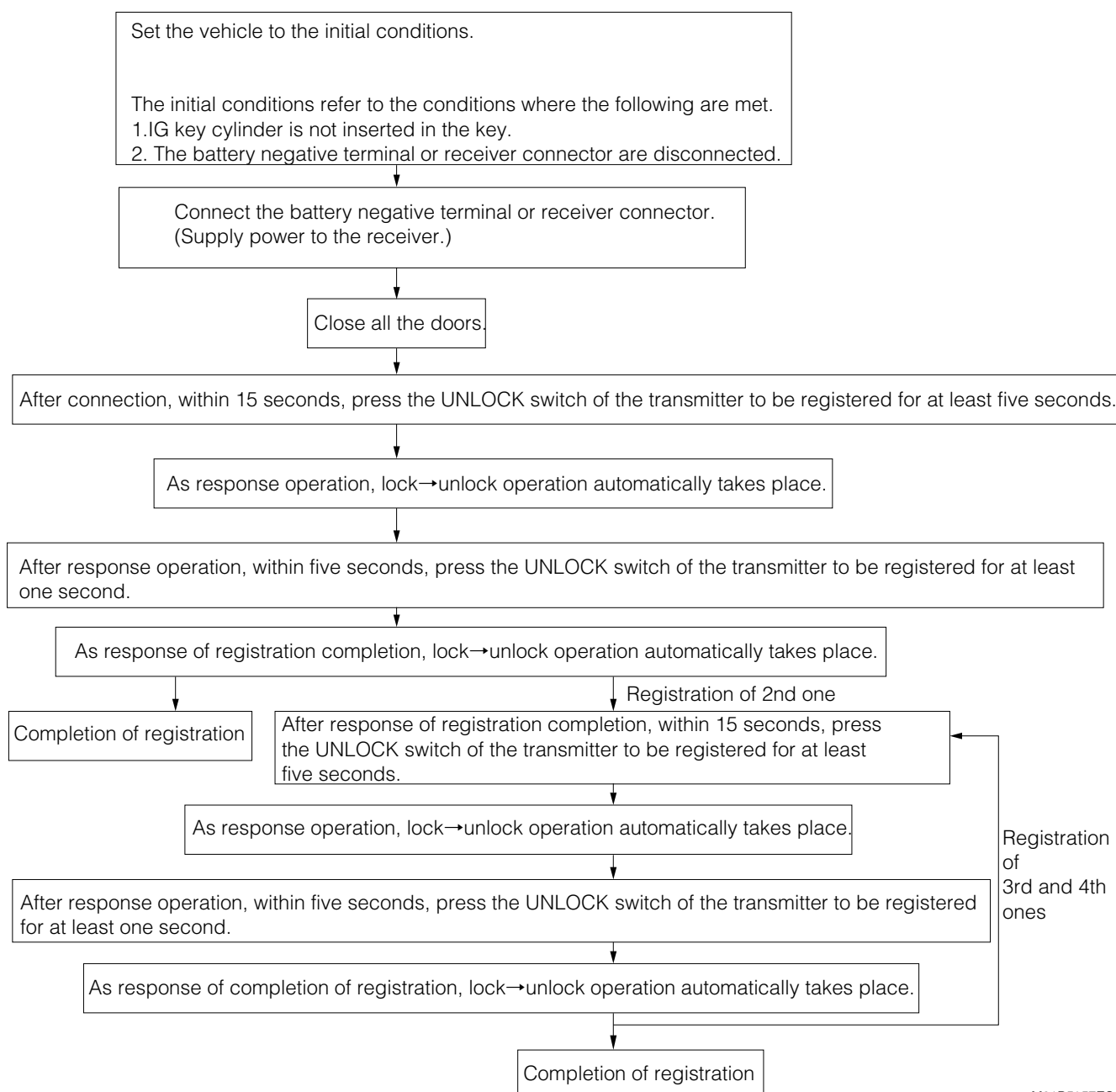
a	Body integrated controller (ITC)
b	Meter ECU
c	Keyless receiver
d	Front door lock motor
e	Rear door lock motor
f	Back door lock motor
g	Room lamp
h	Luggage room lamp
i	Front turn signal lamp
j	Rear turn signal lamp
k	Side turn signal lamp
l	Front door courtesy switch
m	Rear door courtesy switch
n	Transmitter

## 6-6 REGISTRATION OF IDENTIFICATION CODE

### 6-6-1 DESCRIPTION

- 1.If the transmitter is lost or added, it is necessary to register the identification code.
- 2.Maximum four identification codes can be registered for the receiver, and four transmitters can be used. When two or more transmitters are to be registered, register two or more transmitters in sequence by following instructions provided below.
- 3.When a new transmitter is registered, all the old identification codes that had been previously registered in the receiver will be erased.
- 4.Even if the battery is removed, the identification code will not be erased from the memory.

### 6-6-2 HOW TO REGISTER IDENTIFICATION CODE



## 6-7 HOW TO PROCEED WITH TROUBLE SHOOTING

### 6-7-1 INQUIRY

1. In your attempt to remove the causes for a malfunction of the vehicle, you will not be able to remove the causes unless you actually confirm the malfunctioning phenomenon. No matter how long you continue operations, the vehicle may not resume the normal state unless you confirm the malfunctioning phenomenon. The inquiry with the customer is a vital information collecting activity which is to be conducted previous to the confirmation of malfunctioning phenomenon.
2. This inquiry will provide you with an important clue in an effort to reproduce the malfunctioning phenomenon. Furthermore, the information obtained by the inquiry can be referred to during the troubleshooting. Hence, instead of making general questions, it is necessary to focus your questions on the items related to the malfunction.

### (1) DIAGNOSIS BY INTERVIEW SHEET FOR KEY-LESS SYSTEM

Checked by		Check date	Day	Month
			(day of week)	

#### Customer information

Name of customer	Mr./Ms.	Gender of customer (Male, female)	Age [approx. ]	Occupation [ ]	
		Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others	Parking place	Outdoor, indoor

#### Details of vehicle

Date when vehicle was brought to workshop	Day	Month	Date when malfunction took place	Day	Month	Repair history	No, Yes (How many times?)	
	(day of week)			(day of week)				
Frame No.			Registration date	Day	Month	Year	Vehicle model	
Engine type			Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T			Driving	2WD · 4WD
Running distance		km	Equipment	Tire [ ] · Wheel [Steel · Aluminum]				

#### Weather

<input type="checkbox"/> Fine	<input type="checkbox"/> Cloudy	<input type="checkbox"/> Rainy	<input type="checkbox"/> Snow	<input type="checkbox"/> Other( )
Temperature(Approx. )				

#### Frequency of malfunction

<input type="checkbox"/> Always	<input type="checkbox"/> Under certain condition( )	<input type="checkbox"/> Sometimes( )
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#### Phenomenon

<input type="checkbox"/> In case the keyless function (remote control) is inoperative (when there is no new transmitter or no properly functioning transmitter for the same type vehicle).
<input type="checkbox"/> The keyless function (remote control) is inoperative (when there is a new or normally operating transmitter).
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/> Other

## 6-8 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

### 6-8-1 IN CASE THE KEYLESS FUNCTION (REMOTE CONTROL) IS INOPERATIVE (WHEN THERE IS NO NEW TRANSMITTER OR NO PROPERLY FUNCTIONING TRANSMITTER FOR THE SAME TYPE VEHICLE).

#### ▷1. LIN communication system diagnostic code check

1. With the SST, short-circuit the ECU-T terminal and the E terminal in the DLC. Then turn the IG switch "ON".
2. Check the diagnostic code displayed for the LIN communication system.  
SPECIFIED VALUE: Diagnostic codes 0011, 002 are not displayed.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, go to troubleshooting for the LIN communication system.

Refer to Page L2-45.

#### ▷2. Basic function check of keyless system

1. Bring the vehicle into the initial state.

##### NOTE

- Initial state: The key is not inserted in the IG key cylinder.  
All doors are closed.

2. Repeat 3 continuous LOCK and UNLOCK standard operations alternately. Check that the lock/unlock are activated properly after the 3rd trial onward.

##### NOTE

- Standard operation: Move away from the outside handle on the driver's seat by approx. 1m to the right.  
Point the transmitter at the vehicle and press either of the transmitting switches for about 1 second.

SPECIFIED VALUE: The switch shall operate properly.

▼ If it is OK, go to Step ▷3.

▼ In the case of NG, go to Step ▷6.

#### ▷3. Answer back functional check

1. When performing LOCK and UNLOCK operations, check to see if the answer back is performed properly by the room lamp and luggage room lamp that are interlocked with the door, and hazard lamp. (With LOCK operation, the room lamp and the luggage room lamp shall dim for 3 seconds, and the hazard lamp shall make one blink. With UNLOCK operation, the room lamp and the luggage room lamp shall dim for 15 seconds and the hazard lamp shall make two blinks.)

SPECIFIED VALUE: Answer-back function shall operate properly.

▼ If it is OK, the function is normal.

##### NOTE

- Operation range depends on by whom and where the operation is executed, as well as how the transmitter is being held.
- Since the system uses weak electric wave, the operation range may be reduced due to strong electric wave or noise in the operating frequency.

▼ In the case of NG, go to Step ▷4.

## ▷4. Room lamp, hazard lamp check

1. Check that the room lamp and the hazard lamp light up with the switch "ON".

SPECIFIED VALUE: Illuminates.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, check the bulb, fuse and harness of the room lamp, luggage room lamp and hazard lamp.

## ▷5. Wire harness check

1. Check continuity between the room lamp, hazard lamp and the ITC.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the ITC power supply and the earth system.

▼ In the case of NG, repair the harness.

## ▷6. Transmitter battery check

1. Check whether the indicator of the transmitter blinks, when the "LOCK" or "UNLOCK" switch of the transmitter is pressed.

SPECIFIED VALUE: The indicator shall blink.

▼ If it is OK, go to Step ▷7.

▼ In the case of NG, replace battery.

## ▷7. Check by the registration function

1. Bring the vehicles into the initial state.

2. Follow the procedure below to start out in the registration mode.

(1) Disconnect the battery negative (–) terminal or the connector of the keyless receiver.

(2) Connect the battery negative (–) terminal or the connector of the keyless receiver that has been removed.

(3) Close all the doors.

(4) Press the "UNLOCK" switch of the transmitter for more than 5 seconds within 15 seconds after connection has been established.

3. Check whether lock→unlock operates properly after shifted to the registration mode.

SPECIFIED VALUE: Operation shall be normal.

▼ If it is OK, go to Step ▷8.

▼ In the case of NG, go to Step ▷9.

## ▷8. Keyless entry operation check

1. After the identification code has been registered, check basic functions of the keyless entry system to ensure proper operation.

SPECIFIED VALUE: The system shall function properly.

▼ If it is OK, the function is normal.

▼ In the case of NG, the keyless receiver is defective.

**▷9. Keyless receiver check**

Refer to Page I4-25.

- ▼ If it is OK, the function is normal.
- ▼ In the case of NG, the keyless receiver is defective.

**6-8-2 THE KEYLESS FUNCTION (REMOTE CONTROL) IS INOPERATIVE (WHEN THERE IS A NEW OR NORMALLY OPERATING TRANSMITTER).****▷1. Meter check**

1. With the SST, short-circuit the ECU-T terminal and the E terminal in the DLC. Then turn the IG switch "ON".
2. Check the diagnostic code displayed for the LIN communication system.  
SPECIFIED VALUE: Diagnostic codes 0011,0021 are not displayed.

- ▼ If it is OK, go to Step ▷2.
- ▼ In the case of NG, go to trouble shooting for the LIN communication system.  
Refer to Page L2-45.

**▷2. Basic function check of keyless system**

1. Bring the vehicle into the initial state.

**NOTE**

- Initial state: The key is not inserted in the IG key cylinder.  
All doors are closed

2. Repeat 3 continuous LOCK and UNLOCK standard operations alternately. Check that the lock/unlock are activated properly after the 3rd trial onward.

**NOTE**

- Standard operation: Move away from the outside handle on the driver's seat by approx. 1m to the right.  
Point the transmitter at the vehicle and press either of the transmitting switches for about 1 second.

SPECIFIED VALUE: The switch shall operate properly.

- ▼ If it is OK, go to Step ▷3.
- ▼ In the case of NG, go to Step ▷6.

## ▷3. Answer back functional check

1. When performing LOCK and UNLOCK operations, check to see if the answer back is performed properly by the room lamp and luggage room lamp that are interlocked with the door, and hazard lamp. (With LOCK operation, the room lamp and the luggage room lamp shall dim for 3 seconds, and the hazard lamp shall make one blink. With UNLOCK operation, the room lamp and the luggage room lamp shall dim for 15 seconds and the hazard lamp shall make two blinks.)

SPECIFIED VALUE: Answer-back function shall operate properly.

▼ If it is OK, the function is normal.

### NOTE

- Operation range depends on by whom and where the operation is executed, as well as how the transmitter is being held.
- Since the system uses weak electric wave, the operation range may be reduced due to strong electric wave or noise in the operating frequency.

▼ In the case of NG, go to Step ▷4.

## ▷4. Room lamp, hazard lamp check

1. Check that the room lamp and the hazard lamp light up with the switch turned "ON".

SPECIFIED VALUE: Illuminates.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, check the bulb, fuse and harness of the room lamp, and hazard lamp.

## ▷5. Wire harness check

1. Check continuity between the room lamp, hazard lamp and the ITC.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the ITC power supply and the earth system.

▼ In the case of NG, repair the harness.

## ▷6. Transmitter battery check

1. Check whether the indicator of the transmitter blinks, when the "LOCK" or "UNLOCK" switch of the transmitter is executed.

SPECIFIED VALUE: The indicator shall blink.

▼ If it is OK, go to Step ▷7.

▼ In the case of NG, replace the battery.

## ▷7. Check by the registration function

1. Bring the vehicles into the initial state.
2. Follow the procedure below to start out in the registration mode (use a normally functioning transmitter).
  - (1) Disconnect the battery negative (−) terminal or the connector of the keyless receiver.
  - (2) Connect the battery negative (−) terminal or the connector of the keyless receiver that has been removed.
  - (3) Close all the doors.
  - (4) Press the "UNLOCK" switch of the transmitter for more than 5 seconds within 15 seconds after connection has been established.



3. Check whether lock→unlock operates properly after shifted to the registration mode.  
SPECIFIED VALUE: Operation shall be normal.

- ▼ If it is OK, go to Step ▷8.
- ▼ In the case of NG, go to Step ▷10.

#### ▷8. Transmitter basic check

1. Interrupt the operation of the transmitter for more than 5 seconds to discontinue the registration mode.
2. Perform check again by the registration function. (Use the transmitter which was not able to operate.)
3. Take the same procedure as was previously done for the registration mode.
4. Check whether lock→unlock operates properly after shifted to the registration mode.
  - ▼ In the case of NG, go to Step ▷9.
  - ▼ In the case of NG, the transmitter is defective.

#### ▷9. Keyless entry operation check

1. After the identification code has been registered, check basic functions of the keyless entry system to ensure proper operation.  
SPECIFIED VALUE: The system shall function properly.
  - ▼ If it is OK, the function is normal.
  - ▼ In the case of NG, the keyless receiver is defective.

#### ▷10. Keyless receiver check

Refer to Page I4-25.

- ▼ If it is OK, the function is normal.
- ▼ In the case of NG, the keyless receiver is defective.

## 6-9 ECU INPUT/OUTPUT SIGNAL CHECK

### 6-9-1 CHECKING METHOD

1. With the door control relay Ay installed to the fuse block, check to see if each terminal of the fuse block conforms to the following specified value given below.

## 6-9-2 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

Check system	Terminal	Condition	Specified value	Reference (example of measurement)
Power supply	A2(BDR1) – G29(GND) C10(ECU B) – G29(GND)	At all times	Battery voltage	12.8V
IG switch	D4(IG1) – G29(GND)	IG switch "OFF"	About 0V	0V
		IG switch "ON"	Battery voltage	12.5V
Room lamp	G17(CRL) – G29(GND)	All the door "OPEN"	About 0V	0V
		All the door "CLOSED"	Battery voltage	12.6V
Hazard lamp	F5(HZD) – G29(GND)	Hazard lamp is "Extinguished"	Battery voltage	12.7V
		Hazard lamp "blinks"	About 0V	0V
Door lock motor	G16(LKM) – G30(ULM) G1(LKM) – G11(ULM) B4(LKM) – B2(ULM)	When the door control switch is in "LOCK" position.	Battery voltage	12 – 14V
	G30(ULM) – G16(LKM) G11(ULM) – G1(LKM) B2(ULM) – B4(LKM)	When the door control switch is in "UNLOCK" position.	Battery voltage	12 – 14V
Door control switch	G23(LKS) – Body earth	Door control switch "LOCK"	Continuity exists	Continuity exists
	G10(UKS) – Body earth	Door control switch "UNLOCK"	Continuity exists	Continuity exists
Earth	G29(GND) – Body earth	At all times	Continuity exists	Continuity exists

## 6-10 ECU INPUT/OUTPUT SIGNAL CHECK

### 6-10-1 CHECKING METHOD

#### (1) Check

1. Check whether or not the values between the respective terminals of the receiver meet the following specified values.

#### Standard input/output signal of receiver

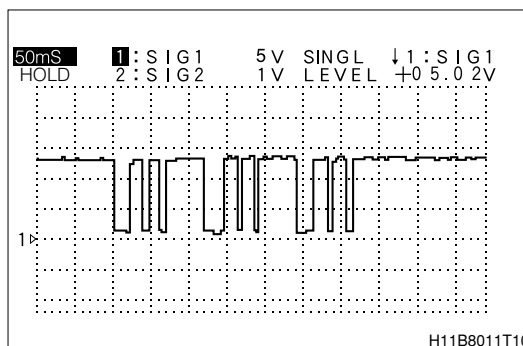
Check system	Terminal	Check items	Specified value	Reference value (Example of measured value)
Power supply	8(+B) – 4(GND)	Voltage	Battery voltage	12.8V
Keyless signal	5(SIG) – 4(GND)	Voltage	About 12V	12V
		Voltage	Pulse generation	※
		Voltage	Pulse generation	※
Earth	4(GND) – Body earth	Continuity	Continuity exists	Continuity exists

※ Refer to the oscilloscope waveform in the following section.

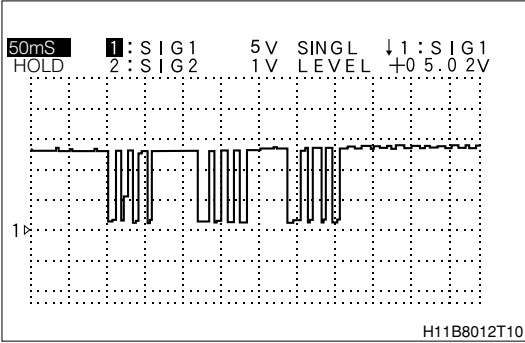
### 6-10-2 OSCILLOSCOPE WAVEFORMS

#### (1) Waveform of keyless signal system

1. Measuring terminals : 5(SIG) – 4(GND)
2. Measurement conditions: When "LOCK" is executed.
3. Measuring range : 5V (voltage axis), 50ms (time axis)



- 4.Measuring terminals : 5(SIG) – 4(GND)
- 5.Measurement condition: When "UNLOCK" is executed.  
Measuring range: 5V (voltage axis), 50ms (time axis)



## IMMOBILIZER SYSTEM

### 1 STEERING COLUMN W/SWITCH BRACKET

#### 1-1 REMOVAL AND INSTALLATION

Refer to Page G1-5.

### 2 TRANSPONDER KEY COIL

#### 2-1 REMOVAL AND INSTALLATION

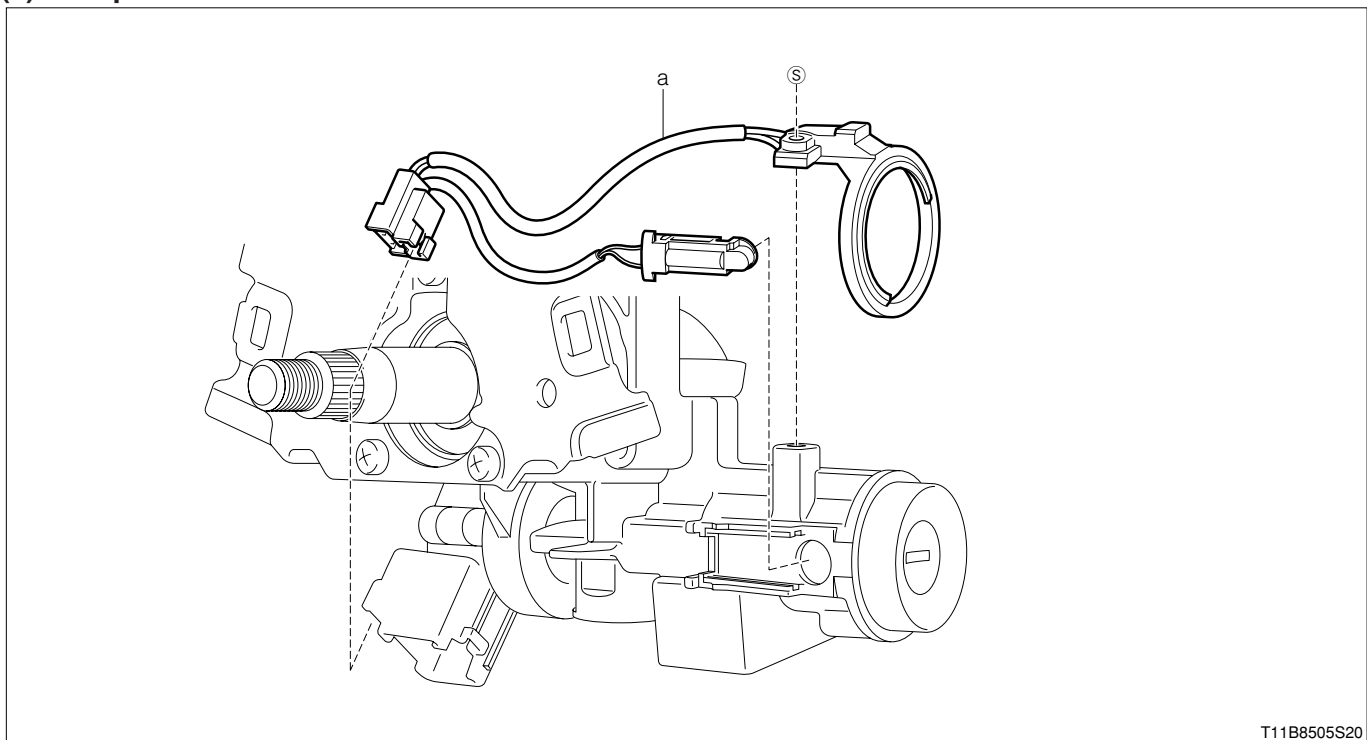
##### 2-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (–) terminal.
2. Remove the steering column lower cover.  
Refer to Page G1-5.

3. Remove the steering column upper cover.  
Refer to Page G1-5.

##### 2-1-2 REMOVAL AND INSTALLATION PROCEDURES

###### (1) Components



T11B8505S20

###### (2) Removal and installation procedures

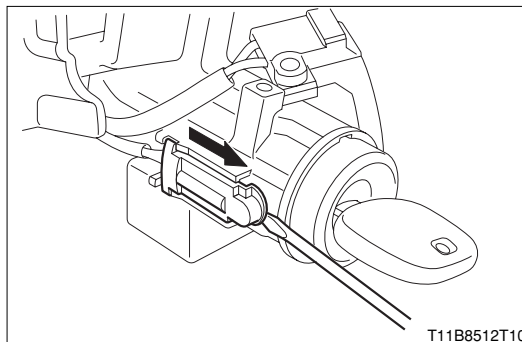
- ▼ 1 a Coil, transponder key

##### 2-1-3 POINTS OF REMOVAL

###### (1) Coil, transponder key

1. Insert the key into the key cylinder.
2. With the key inserted, insert a flat screwdriver or the like into between the coil case and the ignition switch lock cylinder Ay.

3. With the flat screwdriver or the like inserted, push the case to the right to remove.



#### **2-1-4 OPERATION AFTER INSTALLATION**

1. Install the steering column upper cover.  
Refer to Page G1-5.
2. Install the steering column lower cover.  
Refer to Page G1-5.
3. Connect the battery negative (–) terminal.

## 3 TRANSPONDER KEY COMPUTER

### 3-1 REMOVAL AND INSTALLATION

#### CAUTION

- Be careful not to drop the transponder key computer Ay or give great impacts to it.
- If the transponder key computer Ay dropped or was subjected to great impacts, replace it with a new one even if there is no abnormality in its external appearance.
- Refer to the precaution on maintenance for SRS airbag system.

Refer to Page A1-26.

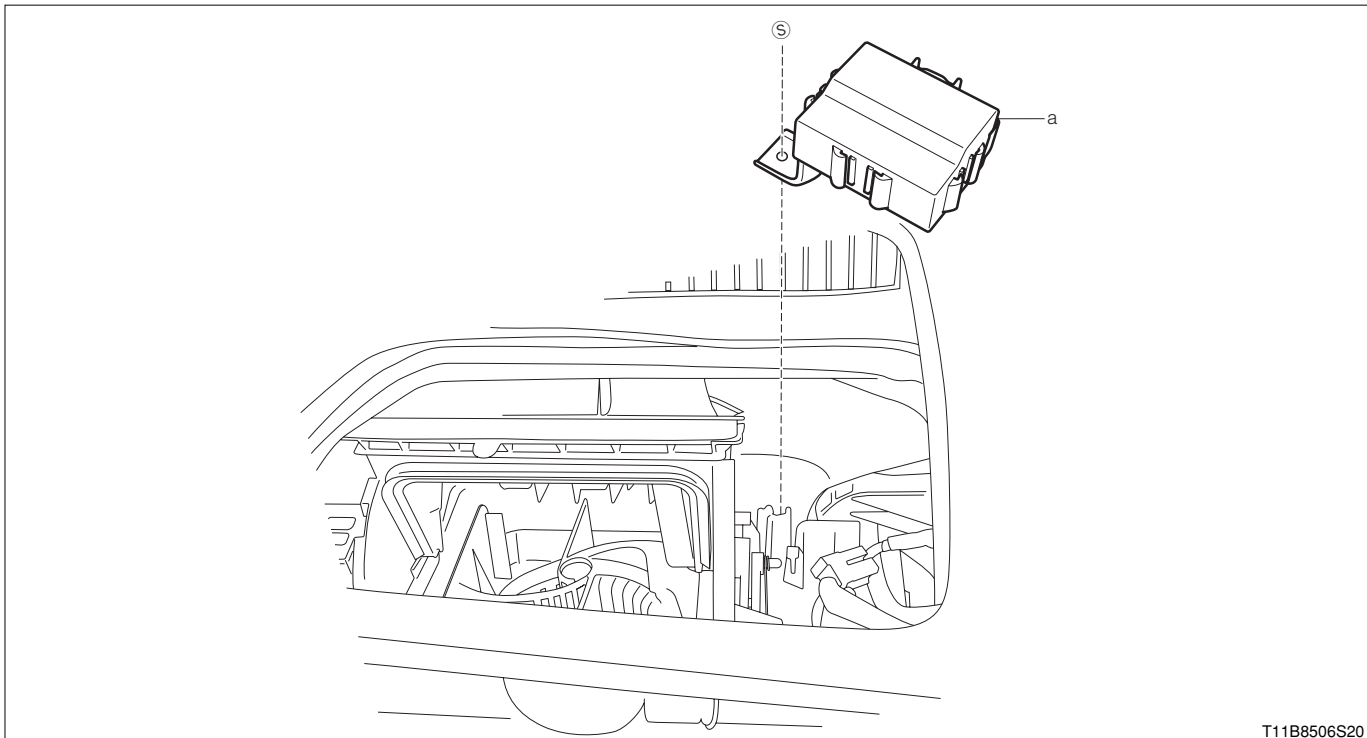
#### 3-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (–) terminal.
2. Remove the instrument panel passenger airbag Ay.  
Refer to Page H1-11.

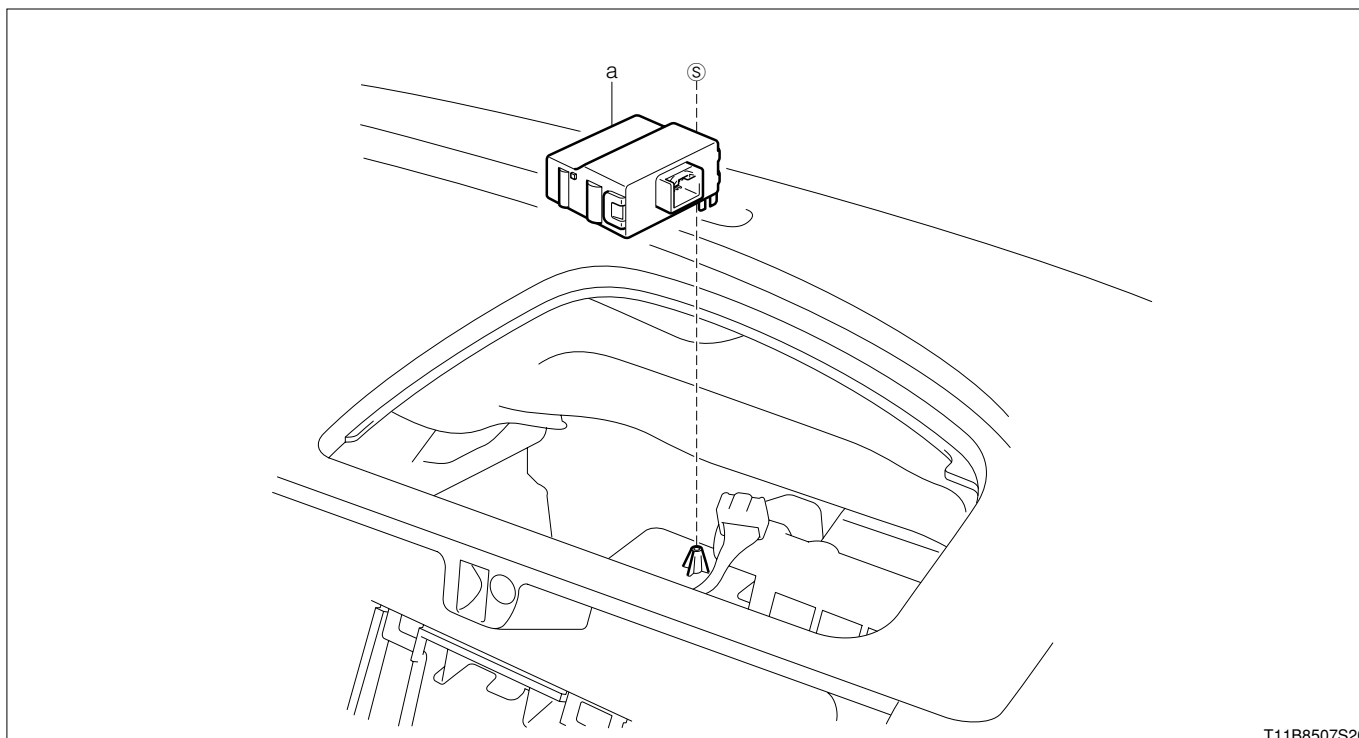
#### 3-1-2 REMOVAL AND INSTALLATION PROCEDURES

##### (1) Components

RHD vehicles



LHD vehicles



T11B8507S20

## (2) Removal and installation procedures

- 1 a Computer Ay, transponder key

### 3-1-3 INSPECTION

#### (1) Computer Ay, transponder key

1. Replace the computer with a new one in the following cases.

(1) Case where the computer Ay has deformation, abrasion, cracks or breakage.

#### **CAUTION**

- Never disassemble the computer.

### 3-1-4 OPERATION AFTER INSTALLATION

1. Install the instrument panel passenger airbag Ay.


Refer to Page H1-11.

2. Connect the battery negative (–) terminal.

## 4 IMMOBILIZER SYSTEM

### 4-1 ARTICLES TO BE PREPARED

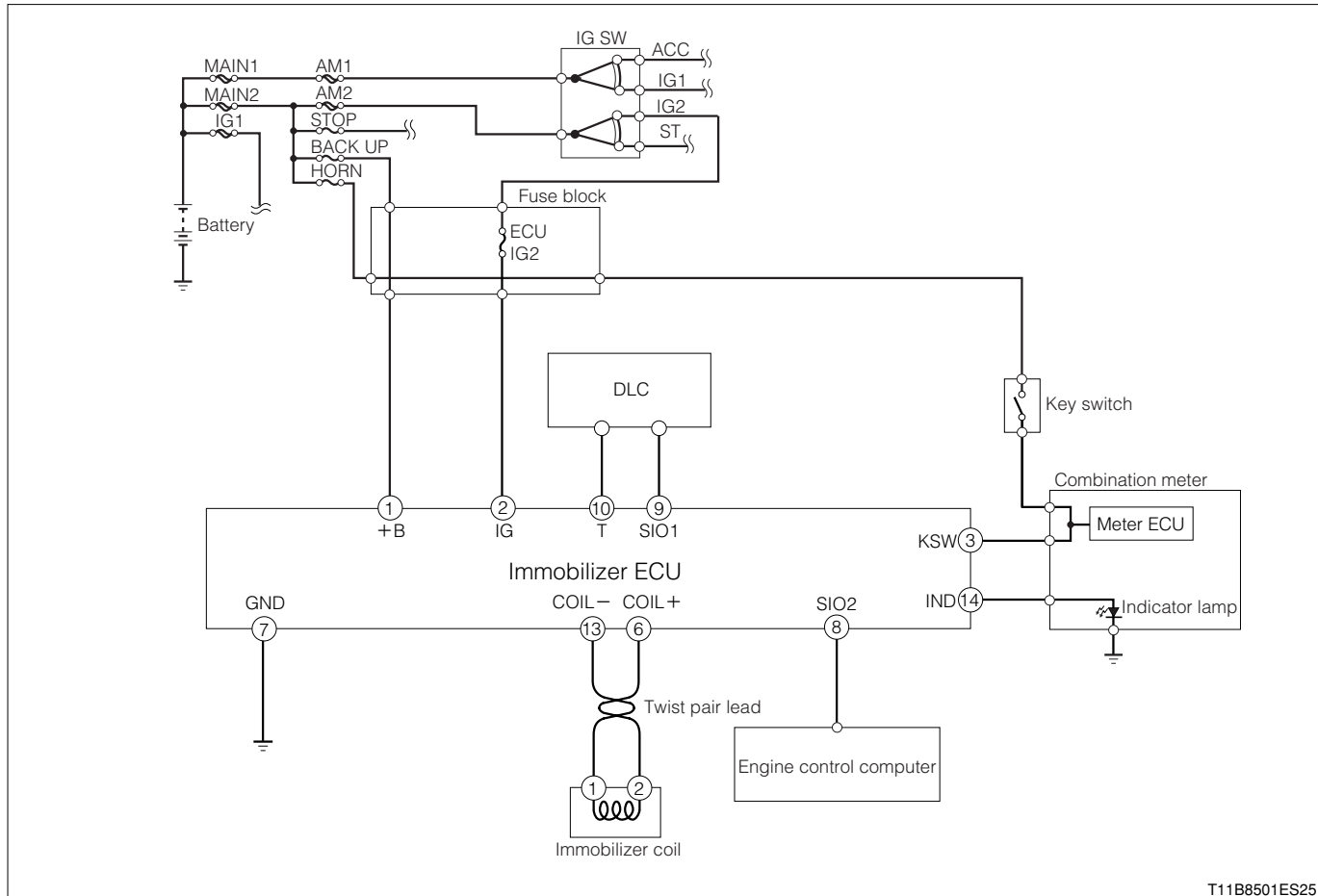
SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check

Instrument

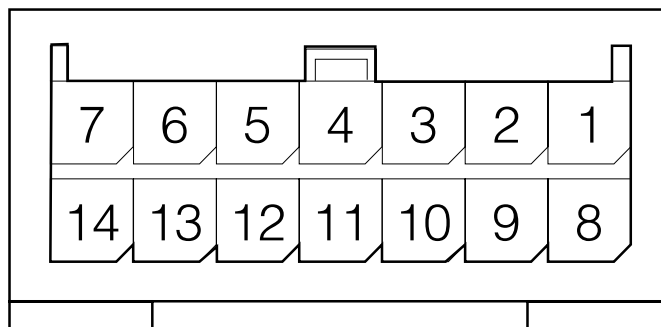
Voltage tester
----------------

### 4-2 SYSTEM WIRING DIAGRAM





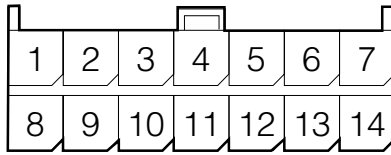
## 4-3 ARRANGEMENT OF ECU TERMINAL



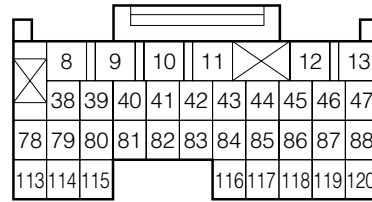
T11B8502S16

Terminal No.	Terminal code	Terminal name
1	+B	ECU power supply
2	IG	Ignition switch power supply
3	KSW	Key switch
4	—	—
5	—	—
6	COIL+	Transponder communication
7	GND	Earth
8	SIO2	Immobilizer communication
9	SIO1	Diagnostic tester communication
10	T	Diagnostic tester communication
11	—	—
12	—	—
13	COIL—	Transponder communication
14	IND	Security indicator

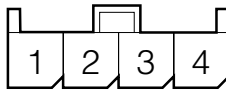
## 4-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS



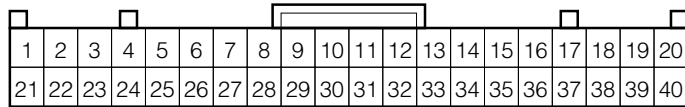
Immobilizer ECU



Engine control computer



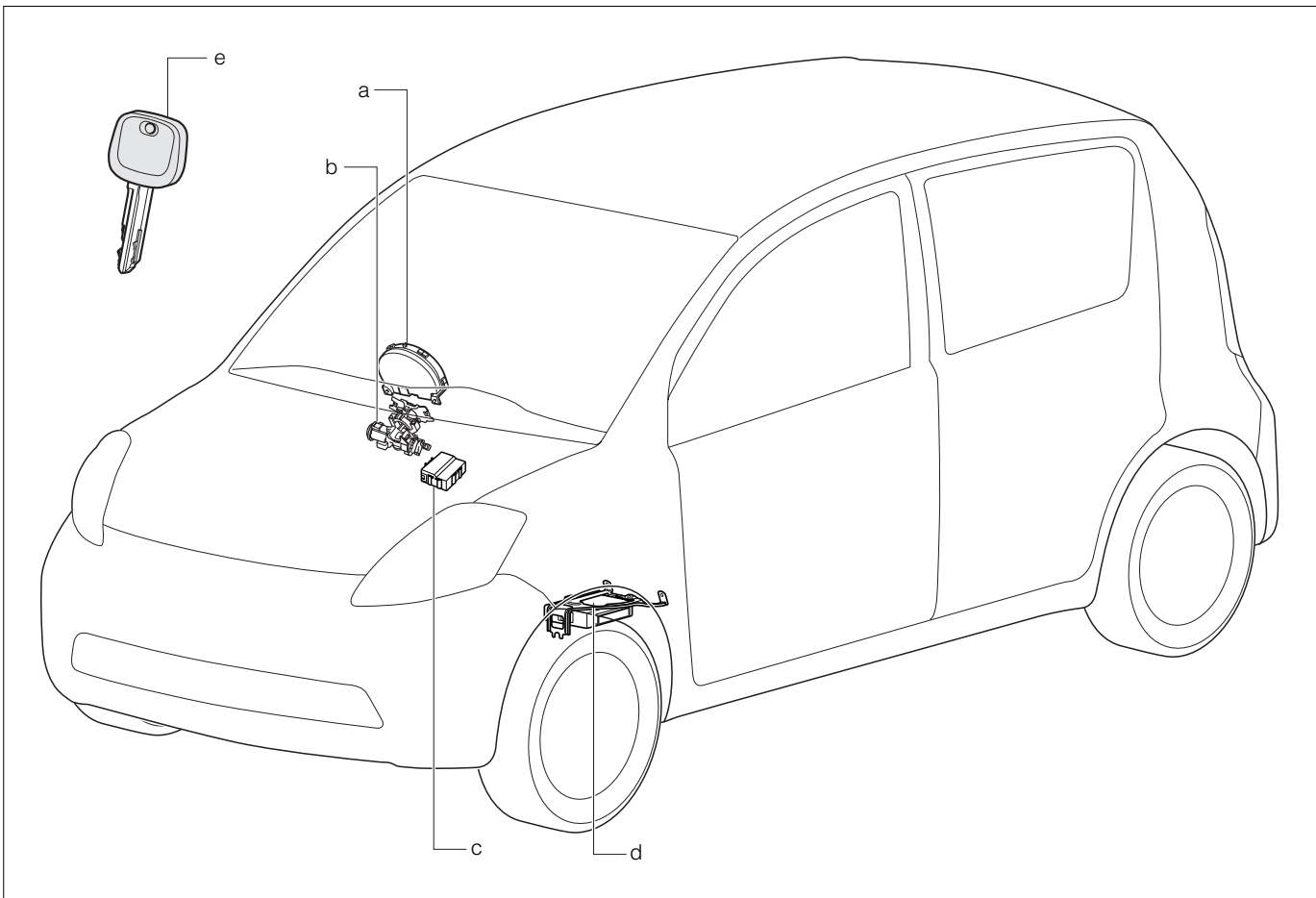
Immobilizer coil  
key switch



Combination meter

T11B8503ES20

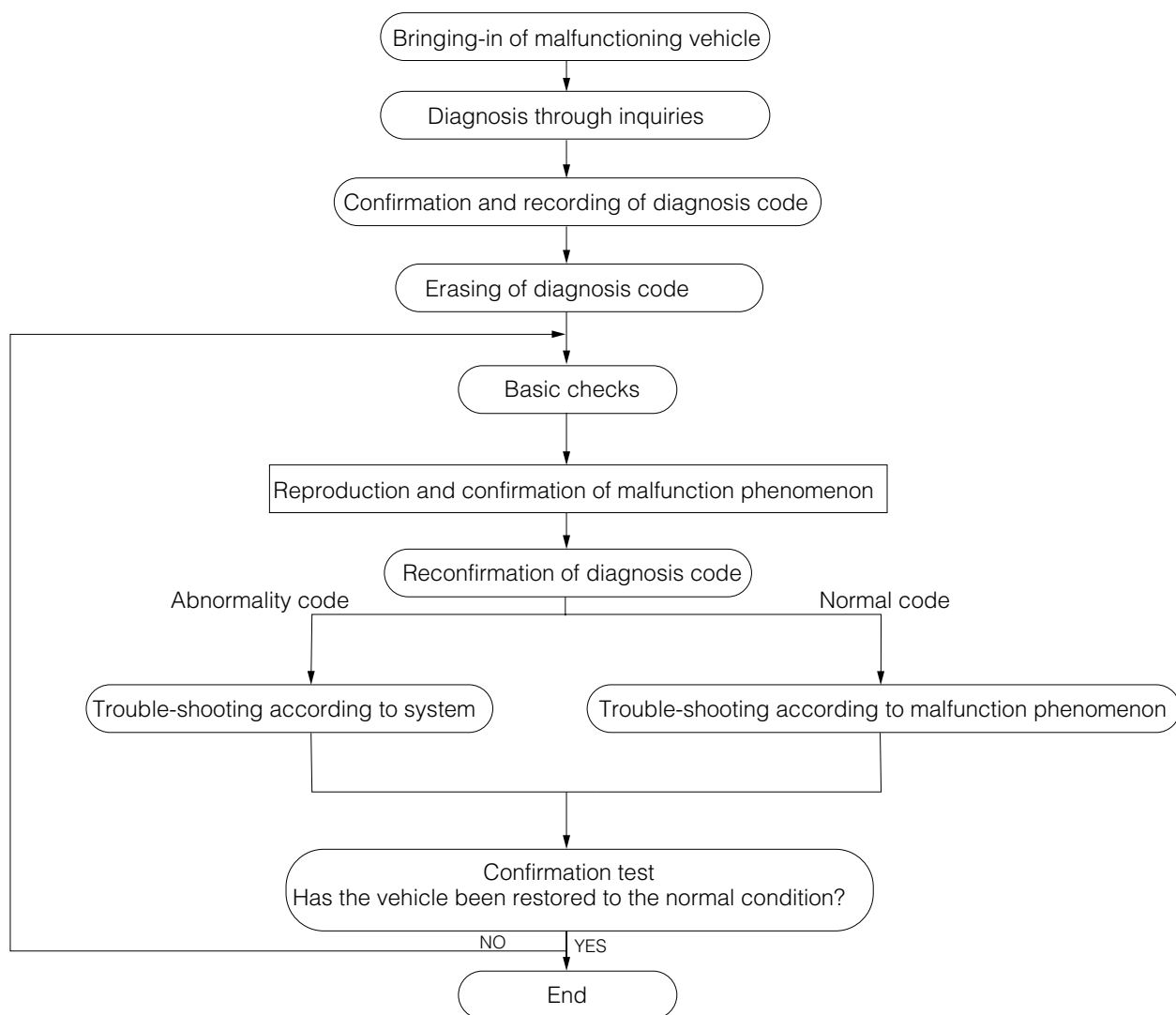
## 4-5 LOCATION OF COMPONENTS



code	Part name
a	Meter ECU
b	Steering column upper W/switch bracket
c	Immobilizer ECU
d	EFI ECU
e	Transponder

#### 4-6 HOW TO PROCEED WITH TROUBLE SHOOTING

- 1.The immobilizer system is equipped with a diagnosis function which diagnoses malfunctioning sections and gives important clues in the trouble shooting.
- 2.The diagnosis function of the immobilizer system is equipped with the battery backup (which keeps supplying power for diagnosis memory even when the ignition switch is set to OFF position).



## 4-7 INQUIRY

1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis through inquiries is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through inquiries provides very important clues in reproducing malfunction phenomena.
2. Since the information obtained by the diagnosis through inquiries is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.

## 4-8 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

### 4-8-1 OUTLINE

1. When the diagnosis code is indicated, confirm whether the malfunction took place sometimes in the system or is still persisting. Also it is necessary to check any relation between the code and the reproduced malfunction. For this purpose, the diagnosis code should be indicated twice, namely before and after the confirmation of the phenomena.

### 4-8-2 CHECKING METHOD OF DIAGNOSIS

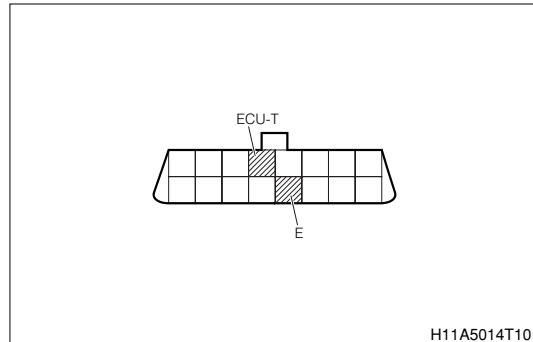
1. Bring the vehicle into the stopped state.
2. Set the IG switch to LOCK. Using the SST, short circuit the terminals ECU-T and E of the DLC located under the instrument panel.

#### CAUTION

- If wrong connector connecting positions are selected, this may cause malfunction. Therefore, utmost care must be paid so as not to choose wrong positions.

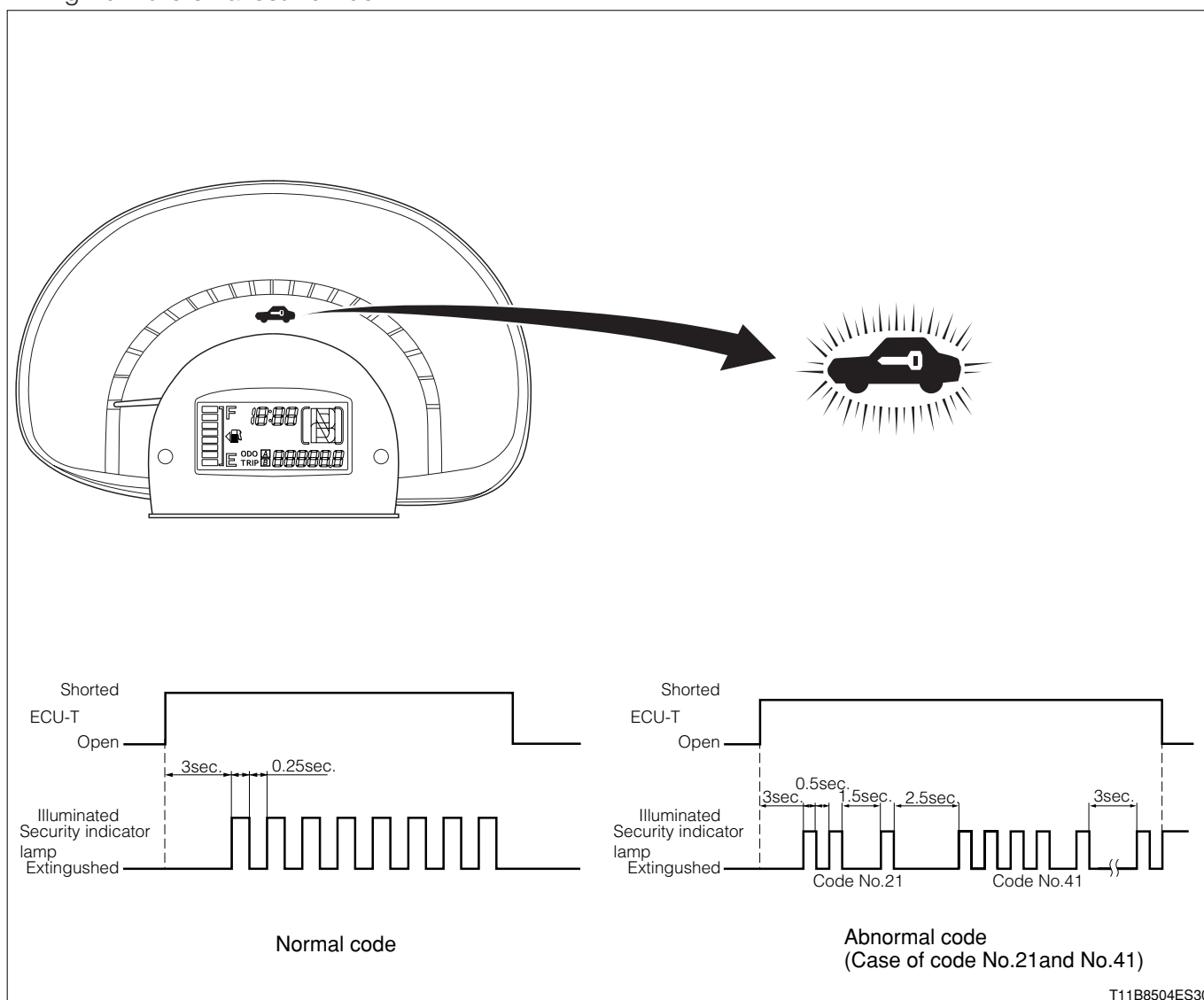
SST: 09991-87403-000

09991-97201-000



H11A5014T10

3. Turn ON the IG switch. Let the security indicator flash and indicate the diagnosis code.
4. All the diagnosis codes memorized are shown repeatedly in the sequence of diagnosis number, starting from the smallest number.



#### 4-8-3 CANCELING METHOD OF DIAGNOSIS

1. When the section which is responsible for the malfunction code has been checked and repaired, erase the memory, following the procedure given below. After the erasure, let the diagnosis code be outputted again and confirm that the normal code is outputted.
  - (1) Disconnect the negative (—) terminal of the battery.

## 4-8-4 CONTENTS OF DIAGNOSIS

### Contents of diagnosis

Code No.		Warning indication (Provided: ○, Not-provided: ✕)	code memorizing (Provided: ○, Not-provided: ✕)	Contents of diagnosis	
2-digit	4-digit			Diagnosis system	Diagnosis item
12	B2796	○	✕	Immobilizer coil	Faulty key or immobilizer coil
15	B2780	○	○	Key switch	Key switch "OFF" malfunction
21	B2795	○	○	Transponder signal sending	Mismatching of key ID codes
22	B2794	○	○		Mismatching of key ID codes
23	B2793	○	○	Transponder lock	Key ID codes not registered
24	B2797	○	✕	Transponder communi- cation	Transponder communication faulty
25	B2798	○	✕		Frame receiving faulty
41	B2788	○	○	Communication with EFI (Code mismatching)	Faulty communication with EFI ECU (1)
42	B2789	○	○	Communication with EFI (No signal receiving)	Faulty communication with EFI ECU (2)

## 4-9 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

### 4-9-1 DIAGNOSIS CODE NO.12

#### (1) Checking points

1. Is immobilizer coil normal?
2. Are the harness and connector between the immobilizer coil and the immobilizer ECU normal?

#### (2) Checking method

##### ▷1. Wire harness continuity check

1. Check continuity between the following terminals.
  - (1) Immobilizer coil vehicle harness side 1(COIL+) – immobilizer ECU vehicle harness side 6(COIL+)
  - (2) Immobilizer coil vehicle harness side 2(COIL-) – immobilizer ECU vehicle harness side 13(COIL-)

SPECIFIED VALUE: Continuity exists

- ▼ If it is OK, go to Step ▷2.
- ▼ If it is NG, replace the harness and connector.

##### ▷2. Immobilizer coil unit check

1. Perform unit check of the transponder key coil (immobilizer coil).  
Refer to Page I4-41.

SPECIFIED VALUE: No abnormality exists.

- ▼ If it is OK, go to Step ▷3.
- ▼ If it is NG, replace the transponder key coil.

##### ▷3. Operation check by other key

1. Check the operation by the master key.  
SPECIFIED VALUE: The system should operate properly.

- ▼ If it is OK, perform the key replacement and re-registration.
- ▼ If it is NG, replace the transponder key coil.

**4-9-2 DIAGNOSIS CODE NO.15****(1) Checking points**

1. Is the key insertion switch normal?

**(2) Checking method****▷1. Wire harness continuity check**

1. Check continuity between the following terminals.

- (1) Vehicle harness side 4(+) of upper steering column W/switch bracket Ay — Battery positive (+) terminal
- (2) Vehicle harness side 3(−) of upper steering column W/switch bracket Ay — Meter vehicle harness side 26(KEY2)
- (3) Immobilizer ECU vehicle harness side 3(KEY) — Meter vehicle harness side 26(KEY2)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to Step ▷2.

▼ If it is NG, replace the harness and connector.

**▷2. Key insertion switch check**

1. Perform unit check of the upper steering column W/switch bracket Ay (Key insertion switch).

SPECIFIED VALUE: No abnormality exists.

▼ If it is OK, this completes the check.

▼ If it is NG, replace the transponder key coil.

**4-9-3 DIAGNOSIS CODE NO.21, NO.22****(1) Checking points**

1. Is the registered key use?
2. Is the key properly used?
3. Is immobilizer ECU normal?

**(2) Checking method****▷1. Operation check by the master key**

1. Check to see if the engine can start by the master key.

SPECIFIED VALUE: The engine can start.

▼ If it is OK, perform the key re-registration.

**NOTE**

- The ID code of the key used has not been registered yet.

▼ If it is NG, go to Step ▷2.

**▷2. Check of key use conditions**

1. Check to see if the key is used in a wrong way.

SPECIFIED VALUE: Do not use the keys in an overlapped state. Use the key correctly.

▼ If it is OK, replace the immobilizer ECU. Then, proceed to ▷3.

▼ If it is NG, use the key correctly.

## ▷3.Check of immobilizer ECU operation

- 1.After the key ID code has been registered on the immobilizer ECU, check that the system functions normally.

SPECIFIED VALUE: The engine can start.

▼ If it is OK, this completes the check.

▼ If it is NG, replace the transponder key coil.

## 4-9-4 DIAGNOSIS CODE NO.23

### (1) Checking points

- 1.Is the master key normal?

### (2) Checking method

#### ▷1.Confirmation of diagnosis code

- 1.After registering the ID code of the master key again, check the output of the diagnosis code.

SPECIFIED VALUE: The normal code is outputted.

▼ If it is OK, this completes the check.

▼ If it is NG, perform the key replacement and re-registration of the key ID code.

### CAUTION

- Be sure to recover the master key that has been replaced.

## 4-9-5 DIAGNOSIS CODE NO.24, NO.25

### (1) Checking points

- 1.Are the keys located too close?
- 2.Does the communication line has a noise source?

### (2) Checking method

#### ▷1. Immobilizer ECU check

- 1.Insert a registered master key into the key cylinder.
- 2.Check to see if noises exist at the immobilizer ECU computer side terminal 6(COL+).

SPECIFIED VALUE: Noises are detected.

### NOTE

- The communication line has noises to a certain degree.

▼ If it is OK, remove the causes for the noises.

▼ If it is NG, go to Step ▷2.

#### ▷2. Operation check of upper steering column W/switch bracket Ay

- 1.Replace the upper steering column W/switch bracket Ay with a properly functioning one (for check use).
- 2.Check to see if the engine starts.

SPECIFIED VALUE: Starts.

▼ If it is OK, replace the upper steering column W/switch bracket Ay.

▼ If it is NG, replace the immobilizer ECU.

## 4-9-6 DIAGNOSIS CODE NO.41,42

### (1) Checking points

- 1.Are the harness and connector between the EFI ECU and the immobilizer ECU normal?

### (2) Checking method



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**▷1. Wire harness continuity check**

1. Check continuity between the following terminals.

(1) EFI ECU vehicle harness side 117(SIO2) – immobilizer ECU vehicle harness side 8(SIO2)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the immobilizer ECU. Then, proceed to ▷2.

▼ If it is NG, replace the harness and connector.

**▷2. Check of immobilizer ECU operation**

1. After the key ID code has been registered on the immobilizer ECU, check that the system functions normally.

SPECIFIED VALUE: The engine can start.

▼ If it is OK, this completes the check.

▼ If it is NG, replace EFI ECU.

## 4-10 UNIT CHECK

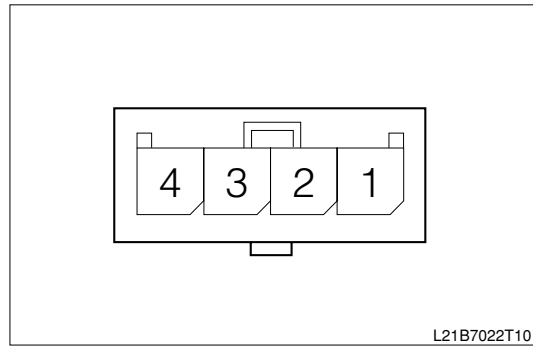
### 4-10-1 STEERING COLUMN UPPER W/SWITCH BRACKET

#### (1) Key insertion switch

1. At the LOCK position of the ignition switch, insert and pull out the key to check continuity between the terminals.

#### Key SW continuity table

		Terminal No.	3 - 4
Switching			
Lock cylinder	Key not inserted		No continuity exists.
	Key inserted		Continuity exists.



#### (2) Immobilizer coil

1. Check continuity between the terminals 1 and 2.  
SPECIFIED VALUE: Continuity exists.

#### CAUTION

- Even if continuity exists, no judgment can be made about whether the coil is normal or not.

