3. Keyless Entry System

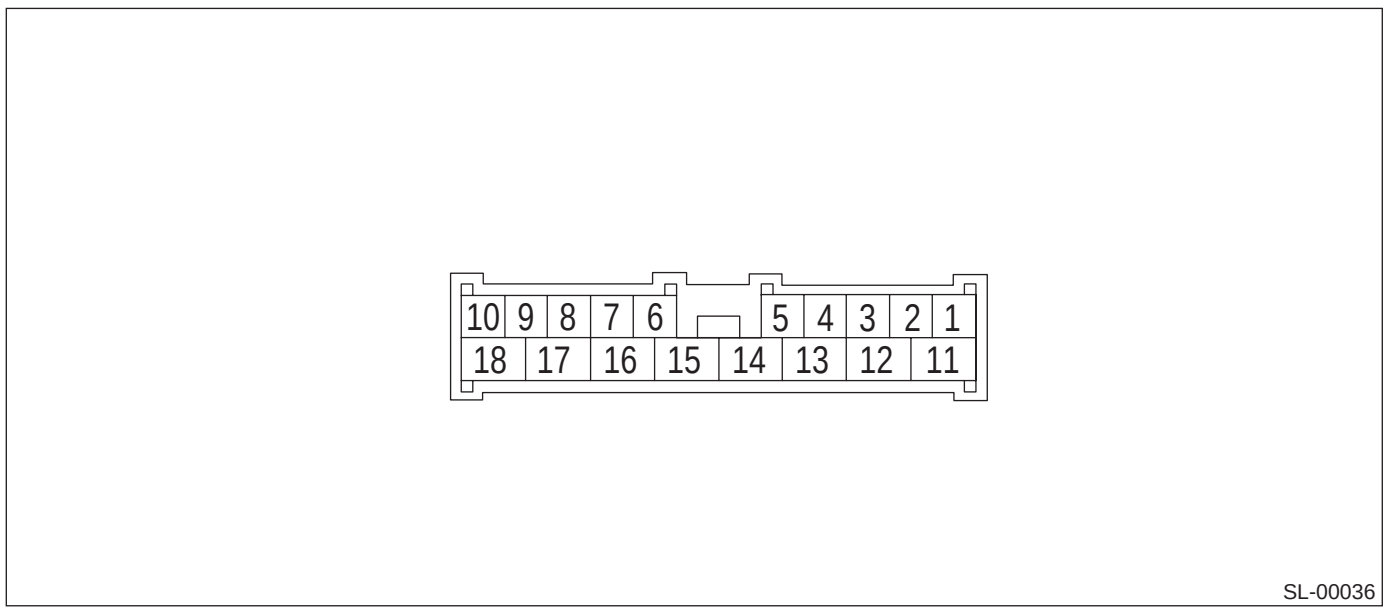
A: SCHEMATIC

1. KEYLESS ENTRY

<Ref. to WI-138, SCHEMATIC, Keyless Entry System.>

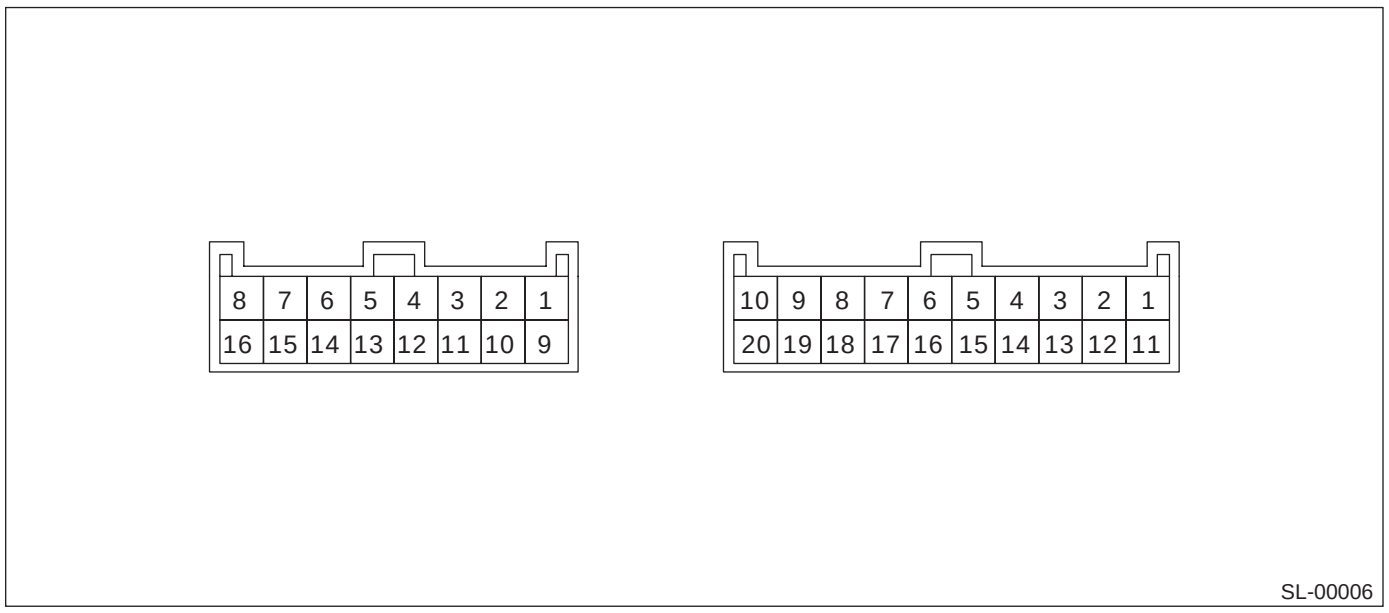
B: ELECTRICAL SPECIFICATION

1. KEYLESS ENTRY CONTROL MODULE



Content	Terminal No.	Measuring condition
Integrated module	1 (OUTPUT)	Battery voltage is present when pressing the transmitter LOCK/ARM button.
Integrated module	2 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM button.
Security control module	3	—
Security control module	4	—
Door lock switch	5 (INPUT)	0 V is present when operating the door lock switch.
Ignition switch (ON)	6 (INPUT)	Battery voltage is present when ignition switch is turned to ON.
Key warning switch	7 (INPUT)	Battery voltage is present when inserting the key into the ignition switch.
Door unlock switch	8 (INPUT)	0 V is present when operating the door lock switch.
Trunk room light switch (Sedan), rear gate latch switch (Wagon)	9 (INPUT)	0 V is present when trunk lid or rear gate is open.
Door switch	10 (INPUT)	0 V is present when any door is open.
Ground	11	0 V is constantly present.
Turn signal light (Left)	12 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM or LOCK/ARM button.
Horn relay	13 (OUTPUT)	0 V is present when pressing the transmitter LOCK/ARM button three times within 5 seconds.
Power supply (Back-up)	14	Battery voltage is constantly present.
Power supply (Back-up)	15	Battery voltage is constantly present.
Keyless buzzer	16 (OUTPUT)	0 V is present when pressing the transmitter UNLOCK/DISARM or LOCK/ARM button.
Security control module	17	—
Turn signal light (Right)	18 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM or LOCK/ARM button.

2. INTEGRATED MODULE



Content	Terminal No.	Measuring condition
Ignition switch illumination	A2 (OUTPUT)	0 V is present when door is opened and then closed.
Door switch (Except driver's door)	A7 (INPUT)	0 V is present when any door is open (Except driver's door).
Door switch (Driver's door)	A8 (INPUT)	0 V is present when driver's door is open.
Door unlock switch	A11 (INPUT)	0 V is present when operating the door lock switch.
Door lock switch	A12 (INPUT)	0 V is present when operating the door lock switch.
Keyless entry control module	A13 (INPUT)	Battery voltage is present when pressing the transmitter LOCK/ARM button.
Keyless entry control module	A14 (INPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DIS-ARM button.
Ignition switch (ON)	A19 (INPUT)	Battery voltage is present when ignition switch is turned to ON.
Key warning switch	A20 (INPUT)	Battery voltage is present when inserting the key into ignition switch.
Power supply	B1	Battery voltage is constantly present.
Power supply	B2	Battery voltage is constantly present.
Ground	B4	0 V is constantly present.
Room light	B5 (OUTPUT)	0 V is present when pressing the transmitter UNLOCK/DISARM button.
Door and rear gate lock actuator	B6 (OUTPUT)	Battery voltage is present when pressing the transmitter LOCK/ARM button.
Door and rear gate lock actuator (Except driver side)	B7 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DIS-ARM button two times.
Door lock actuator (Driver side)	B8 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DIS-ARM button one time.
Ground	B13	0 V is constantly present.

C: INSPECTION

1. SYMPTOM CHART

Symptom	Repair order		Reference
None of the functions of the keyless entry system operate.	1. Check the transmitter battery and function.		<Ref. to SL-14, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the fuse.		<Ref. to SL-15, CHECK FUSE, INSPECTION, Keyless Entry System.>
	3. Check the keyless entry control module power supply and ground circuit.		<Ref. to SL-15, CHECK POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, Keyless Entry System.>
	4. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>
The transmitter cannot be programmed.	1. Check the transmitter battery and function.		<Ref. to SL-14, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the ignition switch circuit.		<Ref. to SL-16, CHECK IGNITION SWITCH CIRCUIT, INSPECTION, Keyless Entry System.>
	3. Check the door switch.		<Ref. to SL-16, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	4. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>
The door lock or unlock does not operate. NOTE: If the door lock control system does not operate when using the door lock switch, check the door lock control system. <Ref. to SL-8, INSPECTION, Door Lock Control System.>	1. Check the transmitter battery and function.		<Ref. to SL-14, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the key warning switch.		<Ref. to SL-17, CHECK KEY WARNING SWITCH, INSPECTION, Keyless Entry System.>
	3. Check the door switch.		<Ref. to SL-16, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	4. Check the output signal to integrated module.		<Ref. to SL-19, CHECK OUTPUT SIGNAL TO INTEGRATED MODULE, INSPECTION, Keyless Entry System.>
	5. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>
The panic alarm does not operate.	1. Check the transmitter battery and function.		<Ref. to SL-14, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the horn operation.		<Ref. to SL-19, CHECK HORN OPERATION, INSPECTION, Keyless Entry System.>
	3. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>
The buzzer chirp and hazard light do not operate.	1. Check the buzzer chirp function.		<Ref. to SL-15, CHECK BUZZER CHIRP SETTING, INSPECTION, Keyless Entry System.>
	2. Check the buzzer and hazard light operation.	Buzzer	<Ref. to SL-20, CHECK KEYLESS BUZZER, INSPECTION, Keyless Entry System.>
		Hazard light	<Ref. to SL-20, CHECK HAZARD LIGHT OPERATION, INSPECTION, Keyless Entry System.>
	3. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>

Symptom	Repair order		Reference
The room light does not turn on.	1. Check the operation of room light.	Room light	<Ref. to SL-18, CHECK ROOM LIGHT OPERATION, INSPECTION, Keyless Entry System.>
	2. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>
The door warning does not operate.	1. Check the door switch.		<Ref. to SL-16, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	2. Check the buzzer operation.		<Ref. to SL-20, CHECK KEYLESS BUZZER, INSPECTION, Keyless Entry System.>
	3. Replace the keyless entry control module.		<Ref. to SL-51, Keyless Entry Control Module.>

2. CHECK TRANSMITTER BATTERY AND FUNCTION

	Step	Value	Yes	No
1	**CHECK TRANSMITTER BATTERY.** 1) Remove the battery from the transmitter. <Ref. to SL-53, REMOVAL, Keyless Transmitter.> 2) Check the battery voltage. <Ref. to SL-53, INSPECTION, Keyless Transmitter.> Is the measured value more than specified value?	2 V	Go to step **2.**	Replace the transmitter battery.
2	**CHECK LED OF TRANSMITTER.** 1) Press the LOCK/ARM or UNLOCK/DISARM button six times to synchronize with the keyless entry control module. 2) Press the LOCK/ARM button. Does the LED blink one time?	LED blinks one time.	Go to step **3.**	Replace the transmitter. <Ref. to SL-53, REPLACEMENT, Keyless Transmitter.>
3	**CHECK LED OF TRANSMITTER.** Keep the LOCK/ARM button pressed. Does the LED blink one time, and then turn on?	LED blinks one time, and then turns on.	Go to step **4.**	Replace the transmitter. <Ref. to SL-53, REPLACEMENT, Keyless Transmitter.>
4	**CHECK LED OF TRANSMITTER.** Press the UNLOCK/DISARM button. Does the LED blink one time?	LED blinks one time.	Go to step **5.**	Replace the transmitter. <Ref. to SL-53, REPLACEMENT, Keyless Transmitter.>
5	**CHECK LED OF TRANSMITTER.** Keep the UNLOCK/DISARM button pressed. Does the LED blink two times?	LED blinks two times.	Transmitter is OK.	Replace the transmitter. <Ref. to SL-53, REPLACEMENT, Keyless Transmitter.>

3. CHECK BUZZER CHIRP SETTING

	Step	Value	Yes	No
1	**CHECK BUZZER CHIRP SETTING.** 1) Check the current setting of the buzzer chirp. 2) Remove the key from the ignition switch. 3) Close all doors and the rear gate. 4) Press the LOCK/ARM or UNLOCK/DISARM button. Does the buzzer signal chirp?	Buzzer signal chirps.	Buzzer chirp function is OK.	Go to step **2.**
2	**CHECK BUZZER CHIRP SETTING.** 1) Press the UNLOCK/DISARM button once. 2) Press both the LOCK/ARM and UNLOCK/DISARM buttons for more than 2 seconds. 3) Press the LOCK/ARM or UNLOCK/DISARM button. Does the buzzer signal chirp?	Buzzer signal chirps.	Buzzer chirp function is OK.	Check the transmitter function. <Ref. to SL-14, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>

4. CHECK FUSE

	Step	Value	Yes	No
1	**CHECK FUSE.** Remove and visually check the fuse No. 6 (in the main fuse box) and No. 3 (in the fuse and relay box). Is the fuse blown out?	Fuse is not blown out.	Check the power supply and ground circuit. <Ref. to SL-15, CHECK POWER SUPPLY AND GROUND CIRCUIT, Keyless Entry System.>	Replace the fuse with a new one.

5. CHECK POWER SUPPLY AND GROUND CIRCUIT

	Step	Value	Yes	No
1	**CHECK POWER SUPPLY.** 1) Disconnect the keyless entry control module harness connector. 2) Measure the voltage between the harness connector terminal and chassis ground. ***Connector & terminal*** ***(B176) No. 14, No. 15 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Go to step **2.**	Check the harness for open circuits and shorts between the keyless entry control module and fuse.
2	**CHECK GROUND CIRCUIT.** Measure the resistance between the harness connector terminal and chassis ground. ***Connector & terminal*** ***(B176) No. 11 — Chassis ground:*** Is the measured value less than specified value?	10 Ω	The power supply and ground circuit are OK.	Repair the harness.

6. CHECK IGNITION SWITCH CIRCUIT

	Step	Value	Yes	No
1	**CHECK IGNITION SWITCH SIGNAL.** 1) Disconnect the keyless entry control module harness connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between harness connector terminal and chassis ground. ***Connector & terminal*** ***(B176) No. 6 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Ignition switch circuit is OK.	Check the harness for open circuits and shorts between the keyless entry control module and ignition relay.

7. CHECK DOOR SWITCH

	Step	Value	Yes	No
1	**CHECK DOOR SWITCH CIRCUIT.** 1) Measure the voltage between the keyless entry control module harness connector terminal and chassis ground. ***Connector & terminal*** ***Front and rear side door:*** ***(B176) No. 10 (+) — Chassis ground (–):*** ***Rear gate or trunk lid:*** ***(B176) No. 9 (+) — Chassis ground (–):*** 2) Is the measured value less than specified value when each door, rear gate or truck lid is opened?	0 V	Go to step **2.**	Go to step **3.**
2	**CHECK DOOR SWITCH CIRCUIT.** 1) Measure the voltage between the keyless entry control module harness connector terminal and chassis ground. ***Connector & terminal*** ***Front and rear side door:*** ***(B176) No. 10 (+) — Chassis ground (–):*** ***Rear gate or trunk lid:*** ***(B176) No. 9 (+) — Chassis ground (–):*** 2) Does the measured value exceed the specified value when all doors and rear gate or truck lid is closed?	10 V	The door switch is OK.	Go to step **3.**
3	**CHECK DOOR SWITCH.** 1) Disconnect the door switch harness connector. 2) Measure the resistance between the door switch terminals. ***Terminal*** ***Door switch No. 1 — No. 3:*** ***Rear gate latch switch or trunk room light switch No. 1 — No. 2:*** 3) Is the measured value more than specified value when the door switch is depressed?	1 MΩ	Go to step **4.**	Replace the door switch.

	Step	Value	Yes	No
4	**CHECK DOOR SWITCH.** 1) Measure the resistance between the door switch terminals. ***Terminal*** ***Door switch No. 1 — No. 3:*** ***Rear gate latch switch or trunk room light switch No. 1 — No. 2:*** 2) Is the measured value less than specified value when the door switch is released?	1 Ω	Check the harness for open circuits and shorts between the integrated module and door switch.	Replace the door switch.

8. CHECK KEY WARNING SWITCH

	Step	Value	Yes	No
1	**CHECK FUSE.** Remove and visually check the fuse No. 6 (in the main fuse box). Is the fuse blown out?	Fuse is not blown out.	Go to step **2.**	Replace the fuse with a new one.
2	**CHECK KEY WARNING SWITCH CIRCUIT.** 1) Disconnect the keyless entry control module harness connector. 2) Insert the key into the ignition switch. (LOCK position) 3) Measure the voltage between the harness connector terminal and chassis ground. ***Connector & terminal*** ***(B176) No. 7 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Go to step **3.**	Go to step **4.**
3	**CHECK KEY WARNING SWITCH CIRCUIT.** 1) Remove the key from the ignition switch. 2) Measure the voltage between the harness connector terminal and chassis ground. ***Connector & terminal*** ***(B176) No. 7 (+) — Chassis ground (–):*** Is the measured value less than specified value?	0 V	Key warning switch is OK.	Go to step **4.**
4	**CHECK KEY WARNING SWITCH.** 1) Disconnect the key warning switch harness connector. 2) Insert the key into the ignition switch. (LOCK position) 3) Measure the resistance between the key warning switch terminals. ***Terminal*** ***No. 1 — No. 2:*** Is the measured value less than specified value?	1 Ω	Go to step **5.**	Replace the key warning switch.

	Step	Value	Yes	No
5	**CHECK KEY WARNING SWITCH.** 1) Remove the key from the ignition switch. 2) Measure the resistance between the key warning switch terminals. ***Terminal*** ***No. 1 — No. 2:*** Is the measured value more than specified value?	1 MΩ	**Check the following:** • Harness for open circuits and shorts between the key warning switch and fuse • Harness for open circuits and shorts between the keyless entry control module and key warning switch	Replace the key warning switch.

9. CHECK ROOM LIGHT OPERATION

	Step	Value	Yes	No
1	**CHECK ROOM LIGHT OPERATION.** Make sure the room light illuminates when the room light switch is turned ON. Does the room light illuminate?	Room light illuminates.	Go to step **2.**	Check the room light circuit.
2	**CHECK HARNESS BETWEEN ROOM LIGHT AND INTEGRATED MODULE.** 1) Disconnect the integrated module harness connector and room light harness connector. 2) Measure the resistance between the integrated module harness connector terminal and the room light harness connector terminal. ***Connector & terminal*** ***(B281) No. 5 — (R52) No. 2:*** Is the measured value less than specified value?	10 Ω	The room light operation circuit is OK.	Check the harness for open circuits and/or shorts between the integrated module and room light.

10.CHECK OUTPUT SIGNAL TO INTEGRATED MODULE

	Step	Value	Yes	No
1	**CHECK OUTPUT SIGNAL.** Measure the voltage between the keyless entry control module harness connector terminal and chassis ground when UNLOCK/DISARM button of transmitter is pressed. ***Connector & terminal*** ***(B176) No. 2 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Go to step **2.**	Replace the keyless entry control module.
2	**CHECK OUTPUT SIGNAL.** Measure the voltage between the keyless entry control module harness connector terminal and chassis ground when LOCK/ARM button of transmitter is pressed. ***Connector & terminal*** ***(B176) No. 1 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Go to step **3.**	Replace the keyless entry control module.
3	**CHECK HARNESS BETWEEN KEYLESS ENTRY CONTROL MODULE AND INTEGRATED MODULE.** 1) Disconnect the keyless entry control module harness connector and integrated module harness connector. 2) Measure the resistance between the keyless entry control module harness connector terminal and integrated module harness connector terminal. ***Connector & terminal*** ***(B176) No. 2 — (B280) No. 14:*** ***(B176) No. 1 — (B280) No. 13:*** Is the measured value less than specified value?	10 Ω	Replace the integrated module.	Check the harness for open circuit or shorts between the keyless entry control module and integrated module.

11.CHECK HORN OPERATION

	Step	Value	Yes	No
1	**CHECK HORN OPERATION.** Make sure the horn sounds when the horn switch is pushed. Does the horn sound?	Horn sounds.	Go to step **2.**	Check the horn circuit.
2	**CHECK HORN OPERATION.** 1) Disconnect the keyless entry control module harness connector. 2) Ground the harness connector terminal with a suitable wire. ***Connector & terminal*** ***(B176) No. 13 — Chassis ground:*** Does the horn sound?	Horn sounds.	Replace the keyless entry control module.	Check the harness for open circuits and/or shorts between the keyless entry control module and horn relay.

12.CHECK HAZARD LIGHT OPERATION

	Step	Value	Yes	No
1	**CHECK HAZARD LIGHT OPERATION.** Make sure the hazard light blinks when hazard switch is turned ON. Does the hazard light blink?	Hazard light blinks.	Go to step **2.**	Check the hazard light circuit.
2	**CHECK OUTPUT SIGNAL.** 1) Remove the key from ignition switch. 2) Close all doors and rear gate or trunk lid. 3) Measure the voltage between keyless entry control module harness connector terminal and chassis ground when LOCK/ARM button of transmitter is pressed. ***Connector & terminal*** ***(B176) No. 12, 18 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Check the harness for open or short between keyless entry control module and turn signal lights.	Replace the keyless entry control module.

13.CHECK KEYLESS BUZZER

	Step	Value	Yes	No
1	**CHECK FUSE.** Remove and check the fuse No. 3 (located in fuse and relay box). Is the fuse blown out?	Fuse is not blown out.	Go to step **2.**	Replace the fuse with a new one.
2	**CHECK KEYLESS BUZZER POWER SUPPLY.** 1) Disconnect the connector from keyless buzzer. 2) Measure the voltage between keyless buzzer harness connector and chassis ground. ***Connector & terminal*** ***(D70) No. 2 (+) — Chassis ground (–):*** Is the measured value more than specified value?	10 V	Go to step **3.**	Check the harness for open or short between fuse and keyless buzzer.
3	**CHECK HARNESS BETWEEN KEYLESS BUZZER AND KEYLESS ENTRY CONTROL MODULE.** 1) Disconnect the connector from keyless entry control module. 2) Measure the resistance between keyless buzzer and keyless entry control module. ***Connector & terminal*** ***(D70) No. 1 (+) — (B176) No. 16:*** Is the measured value less than specified value?	10 Ω	Go to step **4.**	Repair the harness between keyless buzzer and keyless entry control module.
4	**CHECK KEYLESS BUZZER.** Make sure that the buzzer sounds when connecting battery positive terminal to No. 2 terminal of keyless buzzer connector and battery ground terminal to No. 1 terminal of keyless buzzer connector. Does the buzzer sound?	Buzzer sounds.	Replace the keyless entry control module.	Replace the keyless buzzer.