3. Keyless Entry System

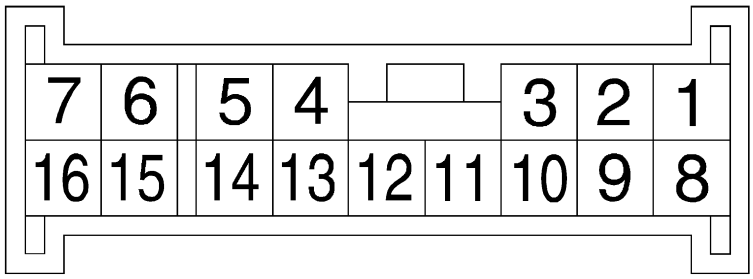
A: SCHEMATIC

1. KEYLESS ENTRY

<Ref. to WI-94, SCHEMATIC, Keyless Entry System.>

B: ELECTRICAL SPECIFICATION

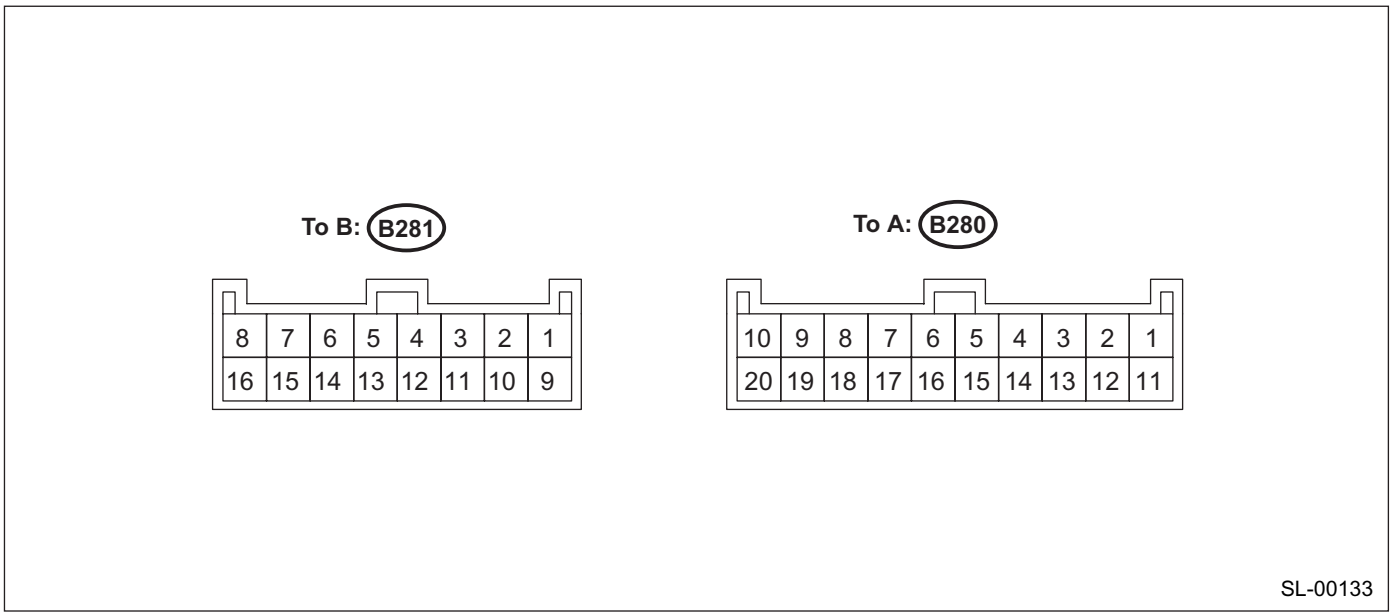
1. KEYLESS ENTRY CONTROL MODULE



SL-00132

Content	Terminal No.	Measuring condition
Integrated module	2 (OUTPUT)	Battery voltage is present when pressing the transmitter LOCK/ARM button one time.
Power supply (Back-up)	3	Battery voltage is constantly present.
Door lock switch	5 (INPUT)	0 V is present when operating the door lock switch.
Trunk room light switch (Sedan)	6 (INPUT)	0 V is present when opening the trunk lid.
Ground	8	0 V is constantly present.
Integrated module	9 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM button one time.
Security control module	10	—
Security control module	11	—
Horn relay	12 (OUTPUT)	0 V is present when pressing the transmitter UNLOCK/DISARM or LOCK/ARM button.
Security control module	13	—
Ignition switch (ON)	14 (INPUT)	Battery voltage is present when ignition switch is turned ON.
Door unlock switch	15 (INPUT)	0 V is present when operating the door unlock switch.
Key warning switch	16 (INPUT)	Battery voltage is present when inserting the key into the ignition switch.
Door switch	7	0 V is present when any door is open.

2. INTEGRATED MODULE



Content	Terminal No.	Measuring condition
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 unlock switch.
Door lock switch	A12 (INPUT)	0 V is present when operating the door lock switch.
Keyless entry control module	A13	—
Keyless entry control module	A14	—
Ignition switch (ON)	A19 (INPUT)	Battery voltage is present when iginition switch is turned 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 one time.
Door and rear gate lock actuator	B6 (OUTPUT)	Battery voltage is present when pressing the transmitter LOCK/ARM button one time.
Door and rear gate lock actuator (Except driver side)	B7 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM button two times.
Door lock actuator (Driver side)	B8 (OUTPUT)	Battery voltage is present when pressing the transmitter UNLOCK/DISARM 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-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the fuse.	<Ref. to SL-18, CHECK FUSE, INSPECTION, Keyless Entry System.>
	3. Check the keyless entry control module power supply and ground circuit.	<Ref. to SL-18, CHECK POWER SUPPLY AND GROUND CIRCUIT, INSPECTION, Keyless Entry System.>
	4. Replace the keyless entry control module.	<Ref. to SL-53, Keyless Entry Control Module.>
The transmitter cannot be programmed.	1. Check the transmitter battery and function.	<Ref. to SL-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the ignition switch circuit.	<Ref. to SL-18, CHECK IGNITION SWITCH CIRCUIT, INSPECTION, Keyless Entry System.>
	3. Check the door switch.	<Ref. to SL-19, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	4. Replace the keyless entry control module.	<Ref. to SL-53, 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-9, INSPECTION, Door Lock Control System.>	1. Check the transmitter battery and function.	<Ref. to SL-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the key warning switch.	<Ref. to SL-20, CHECK KEY WARNING SWITCH, INSPECTION, Keyless Entry System.>
	3. Check the door switch.	<Ref. to SL-19, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	4. Check the output signal to integrated module.	<Ref. to SL-22, CHECK OUTPUT SIGNAL TO INTEGRATED MODULE, INSPECTION, Keyless Entry System.>
	5. Replace the keyless entry control module.	<Ref. to SL-53, Keyless Entry Control Module.>
The panic alarm does not operate.	1. Check the transmitter battery and function.	<Ref. to SL-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the horn operation.	<Ref. to SL-21, CHECK HORN OPERATION, INSPECTION, Keyless Entry System.>
	3. Replace the keyless entry control module.	<Ref. to SL-53, Keyless Entry Control Module.>

Symptom	Repair order	Reference
The horn chirp does not operate.	1. Check the horn chirp function.	<Ref. to SL-17, CHECK HORN CHIRP SETTING, INSPECTION, Keyless Entry System.>
	2. Check the transmitter battery and function.	<Ref. to SL-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	3. Check the key warning switch.	<Ref. to SL-20, CHECK KEY WARNING SWITCH, INSPECTION, Keyless Entry System.>
	4. Check the door switch.	<Ref. to SL-19, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	5. Check the horn operation.	<Ref. to SL-21, CHECK HORN OPERATION, INSPECTION, Keyless Entry System.>
	6. Replace the keyless entry control module.	<Ref. to SL-53, Keyless Entry Control Module.>
The room light operation does not activate.	1. Check the transmitter battery and function.	<Ref. to SL-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>
	2. Check the room light operation.	<Ref. to SL-22, CHECK ROOM LIGHT OPERATION, INSPECTION, Keyless Entry System.>
	3. Check the key warning switch.	<Ref. to SL-20, CHECK KEY WARNING SWITCH, INSPECTION, Keyless Entry System.>
	4. Check the door switch.	<Ref. to SL-19, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>
	5. Check the output signal to integrated module.	<Ref. to SL-22, CHECK OUTPUT SIGNAL TO INTEGRATED MODULE, INSPECTION, Keyless Entry System.>
	6. Replace the keyless entry control module.	<Ref. to SL-53, Keyless Entry Control Module.>
The door warning does not operate.	Check the door switch.	<Ref. to SL-19, CHECK DOOR SWITCH, INSPECTION, Keyless Entry System.>

2. CHECK TRANSMITTER BATTERY AND FUNCTION

	Step	Check	Yes	No
1	**CHECK TRANSMITTER BATTERY.** 1)Remove the battery from the transmitter. <Ref. to SL-55, REMOVAL, Keyless Transmitter.> 2)Check the battery voltage. <Ref. to SL-55, INSPECTION, Keyless Transmitter.> Is the measured value more than the specified value?	2 V	Go to step **2.**	Replace the transmitter battery.
2	**CHECK TRANSMITTER. (SYNC)** 1)Press the LOCK/ARM or UNLOCK/DISARM button five times to synchronize with the keyless entry control module. 2)Press the LOCK/ARM button. Are the doors locked?	Doors are locked.	Go to step **3.**	Replace the transmitter. <Ref. to SL-55, REPLACEMENT, Keyless Transmitter.>
3	**CHECK LED OF TRANSMITTER.** Keep the LOCK/ARM button pressed. Does the LED blink one time and then turn on?	The LED blinks once and then turns on.	Go to step **4.**	Replace the transmitter. <Ref. to SL-55, REPLACEMENT, Keyless Transmitter.>
4	**CHECK LED OF TRANSMITTER.** Press the UNLOCK/DISARM button. Does the LED blink one time?	The LED blinks once.	Go to step **5.**	Replace the transmitter. <Ref. to SL-55, REPLACEMENT, Keyless Transmitter.>
5	**CHECK LED OF TRANSMITTER.** Keep the UNLOCK/DISARM button pressed. Does the LED blink two times?	The LED blinks twice.	The transmitter is OK.	Replace the transmitter. <Ref. to SL-55, REPLACEMENT, Keyless Transmitter.>

3. CHECK HORN CHIRP SETTING

	Step	Check	Yes	No
1	**CHECK HORN CHIRP SETTING.** Check the current setting of the horn chirp. 1)Remove the key from the ignition switch. 2)Close all doors and the rear gate or trunk lid. 3)Press the LOCK/ARM or UNLOCK/DISARM button. Does the horn sound?	The horn sounds.	The horn chirp function is OK.	Go to step **2.**
2	**CHECK HORN CHIRP SETTING.** 1)Press the UNLOCK/DISARM button once. 2)Press both the LOCK/ARM and UNLOCK/DISARM button for more than 2 seconds. 3)Press the LOCK/ARM or UNLOCK/DISARM button. Does the horn sound?	The horn sounds.	The horn chirp function is OK.	Check the transmitter function. <Ref. to SL-16, CHECK TRANSMITTER BATTERY AND FUNCTION, INSPECTION, Keyless Entry System.>

4. CHECK FUSE

	Step	Check	Yes	No
1	**CHECK FUSE.** Remove and visually check the fuse No. 2 (in the main fuse box) Is the fuse blown?	The fuse is not blown.	Check the power supply and ground circuit. <Ref. to SL-18, CHECK POWER SUPPLY AND GROUND CIRCUIT, Keyless Entry System.>	Replace the fuse with a new one.

5. CHECK POWER SUPPLY AND GROUND CIRCUIT

	Step	Check	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. 3 (+) — chassis ground (–):*** Is the measured value more than the 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. 8 — chassis ground:*** Is the measured value less than the specified value?	10 Ω	The power supply and ground circuit are OK.	Repair the harness.

6. CHECK IGNITION SWITCH CIRCUIT

	Step	Check	Yes	No
1	**CHECK IGNITION SWITCH SIGNAL.** 1)Disconnect the keyless entry control module harness connector. 2)Turn the ignition switch ON. 3)Measure the voltage between the harness connector terminal and chassis ground. ***Connector & terminal*** ***(B176) No. 14 (+) — chassis ground (–):*** Is the measured value more than the specified value?	10 V	The 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	Check	Yes	No
1	**CHECK DOOR SWITCH CIRCUIT.** Measure the voltage between the keyless entry control module harness connector terminal and chassis ground. ***Connector & terminal*** ***Front and rear door:*** ***(B176) No. 7 (+) — chassis ground (–):*** ***Rear gate or trunk lid:*** ***(B176) No. 6 (+) — chassis ground (–):*** Is the measured value less than the specified value when each door, rear gate and trunk lid is opened?	0 V	Go to step **2.**	Go to step **3.**
2	**CHECK DOOR SWITCH CIRCUIT.** Measure the voltage between the keyless entry control module harness connector terminal and chassis ground. ***Connector & terminal*** ***Front and rear door:*** ***(B176) No. 7 (+) — chassis ground (–):*** ***Rear gate or trunk lid:*** ***(B176) No. 6 (+) — chassis ground (–):*** Is the measured value more than the specified value when each door, rear gate and trunk 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*** ***Front LH No. 1 — No. 3:*** ***Front RH No. 1 — No. 3:*** ***Rear LH No. 1 — No. 3:*** ***Rear RH No. 1 — No. 3:*** ***Rear gate No. 1 — No. 2:*** ***Trunk lid No. 1 — No. 2:*** Is the measured value more than the specified value when the door switch is pushed?	1 MΩ	Go to step **4.**	Replace the door switch.
4	**CHECK DOOR SWITCH.** Measure the resistance between the door switch terminals. ***Terminal*** ***Front LH No. 1 — No. 3:*** ***Front RH No. 1 — No. 3:*** ***Rear LH No. 1 — No. 3:*** ***Rear RH No. 1 — No. 3:*** ***Rear gate No. 1 — No. 2:*** ***Trunk lid No. 1 — No. 2:*** Is the measured value less than the specified value when the door switch is released?	1 Ω	Check the harness for open circuits and shorts between the keyless entry control module and door switch.	Replace the door switch.

8. CHECK KEY WARNING SWITCH

	Step	Check	Yes	No
1	**CHECK FUSE.** Remove and visually check the fuse No. 6 (in the main fuse box). Is the fuse blown?	The fuse is not blown.	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. 16 (+) — chassis ground (–):*** Is the measured value more than the 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. 16 (+) — chassis ground (–):*** Is the measured value less than the specified value?	0 V	The 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 the specified value?	1 Ω	Go to step **5.**	Replace the key warning switch.
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 the 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 HORN OPERATION

	Step	Check	Yes	No
1	**CHECK HORN OPERATION.** Make sure the horn sounds when the horn switch is pushed. Does the horn sound?	The 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. 12 — chassis ground:*** Does the horn sound?	The 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.

10.CHECK ROOM LIGHT OPERATION

	Step	Check	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?	The 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 the 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.

11.CHECK OUTPUT SIGNAL TO INTEGRATED MODULE

	Step	Check	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. 9 (+) — Chassis ground (–):*** Is the measured value more than the 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. 2 (+) — Chassis ground (–):*** Is the measured value more than the 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 conector terminal. ***Connector & terminal*** ***(B176) No. 9 — (B280) No. 14:*** ***(B176) No. 2 — (B280) No. 13:*** Is the measured value less than the 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.