ONSTAR (R) (DIAGNOSTICS)

OS

1. Basic Diagnostic Procedure

A: PROCEDURE

NOTE:
To check harness for broken wires or short circuits, shake it while holding it or the connector.

	Step	Check	Yes	No
1	**CHECK PRE-INSPECTION.** 1) Before performing diagnosis, inspect unit which might influence OnStar (R) problem. <Ref. to OS-3, INSPECTION, General Description.>	Is unit that might influence the problem normal?	Go to step **2.**	Repair or replace each unit.
2	**CHECK OnStar (R) LED.** 1) Make sure the red LED of OnStar (R) comes on when ignition switch is ON?	Does the red LED come on?	Go to step **3.**	Go to step **4.**
3	**CHECK INDICATION OF DIAGNOSTIC TROUBLE CODE (DTC).** 1) Calling up the diagnostic trouble code (DTC). <Ref. to OS-10, OPERATION, Read Diagnostic Trouble Code (DTC).> 2) Record all DTCs. Confirm the meaning of DTC using the list of DTC. <Ref. to OS-17, LIST, List of Diagnostic Trouble Code (DTC).> 3) Proceed with the diagnosis corresponding to the diagnostic trouble code (DTC). <Ref. to OS-18, Diagnostics Chart with Trouble Code.> Confirm repair by activating system.	Is repair work completed?	System is OK.	Go to step **1.**
4	**PERFORM DIAGNOSIS ACCORDING TO THE SYMPTOM.** Perform diagnostic procedure according to the symptom. <Ref. to OS-33, Diagnosis for Each Symptom.> Confirm repair by activating system.	Is repair work completed?	System is OK.	Go to step **1.**

2. General Description

A: CAUTION

When the inspection procedure must be performed pressing each OnStar (R) button, call the OnStar (R) call center first.
When VIU and VCU are replaced, contact to the OnStar (R) call center to ask for set-up.

B: INSPECTION

Before performing diagnostics, check the following items which might affect OnStar (R) problems.

1. BATTERY

Measure the battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V or more

Specific gravity: Above 1.260

2. AIRBAG

Inspect that airbag system is normal. <Ref. to AB-2, Basic Diagnostic Procedure.>

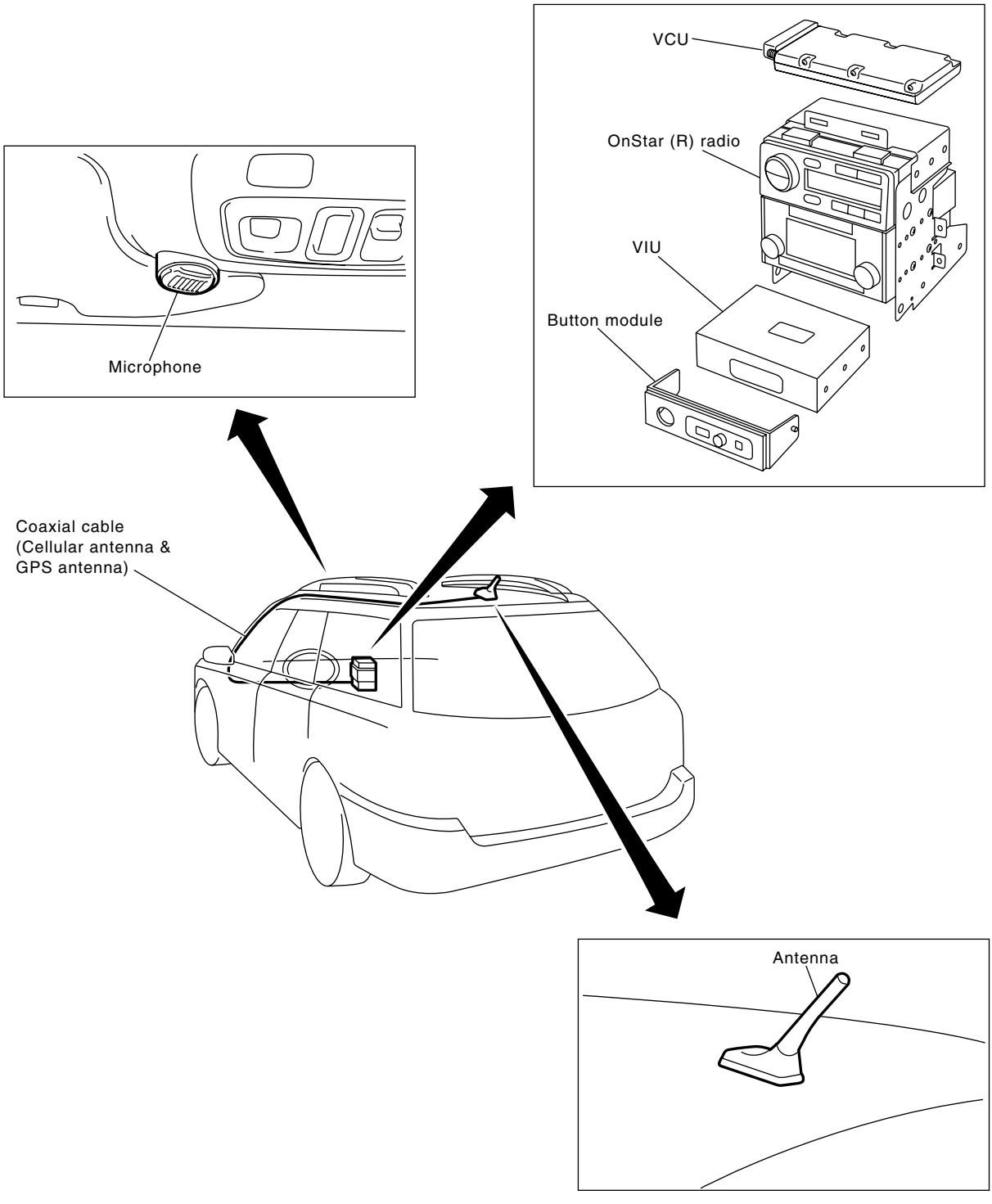
C: PREPARATION TOOL

1. GENERAL PURPOSE TOOLS

TOOL NAME	REMARKS
Circuit Tester	Used for measuring resistance, voltage and ampere.

3. Electrical Components Location

A: LOCATION



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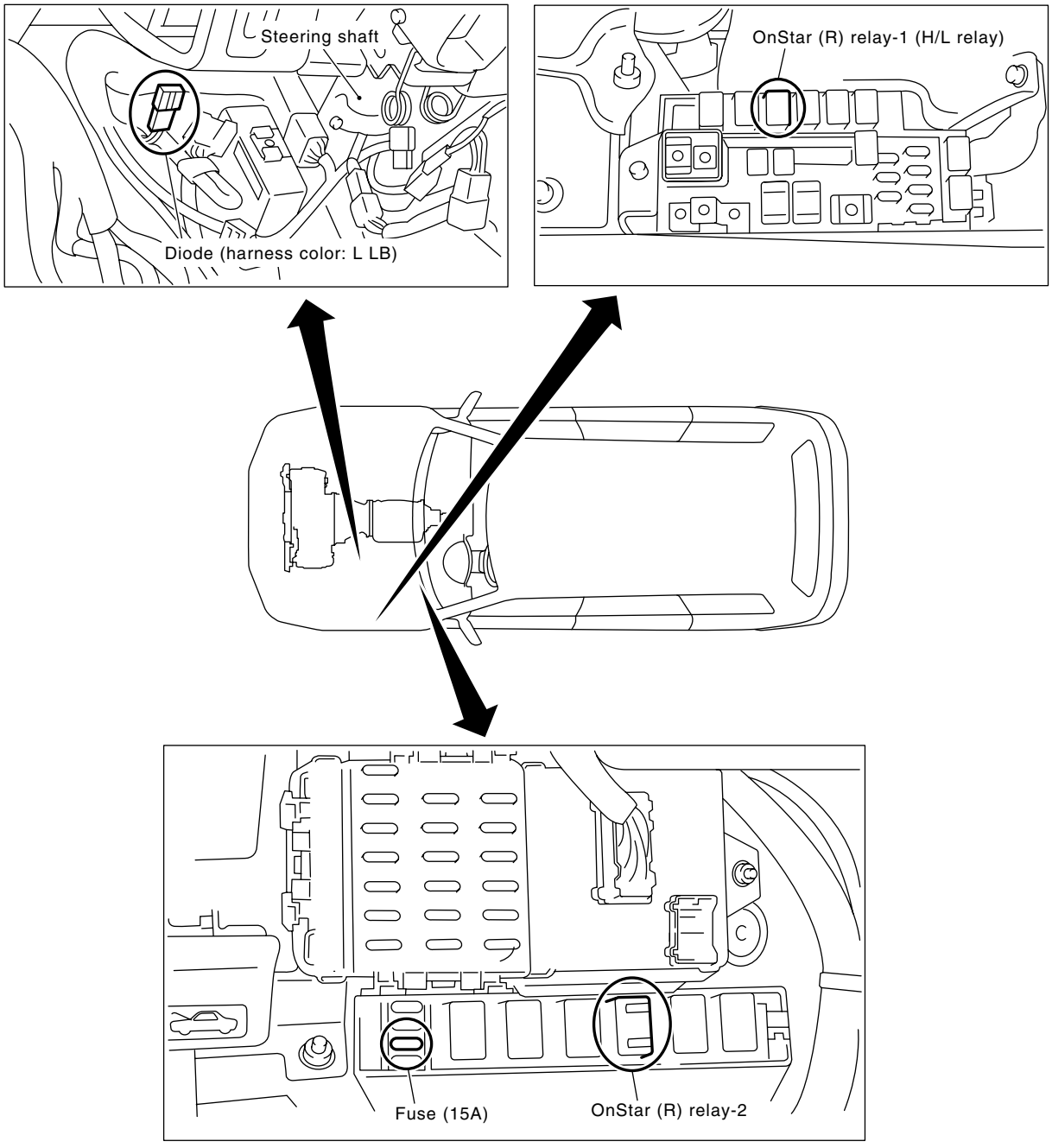
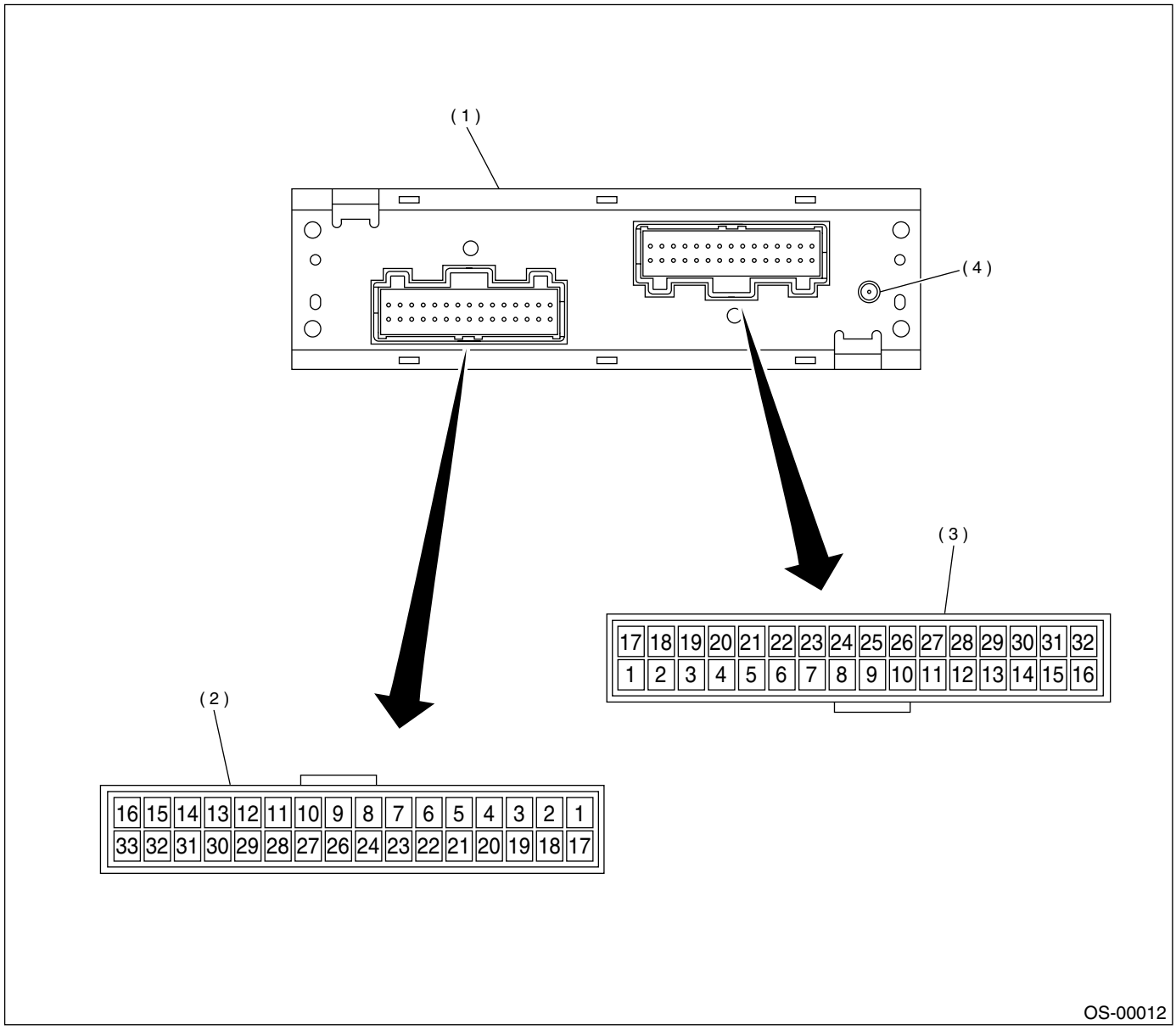

Steering shaft
Diode (harness color: L LB)
OnStar (R) relay-1 (H/L relay)
Fuse (15A)
OnStar (R) relay-2

OS-00011

4. Control Module I/O Signal

A: ELECTRICAL SPECIFICATION

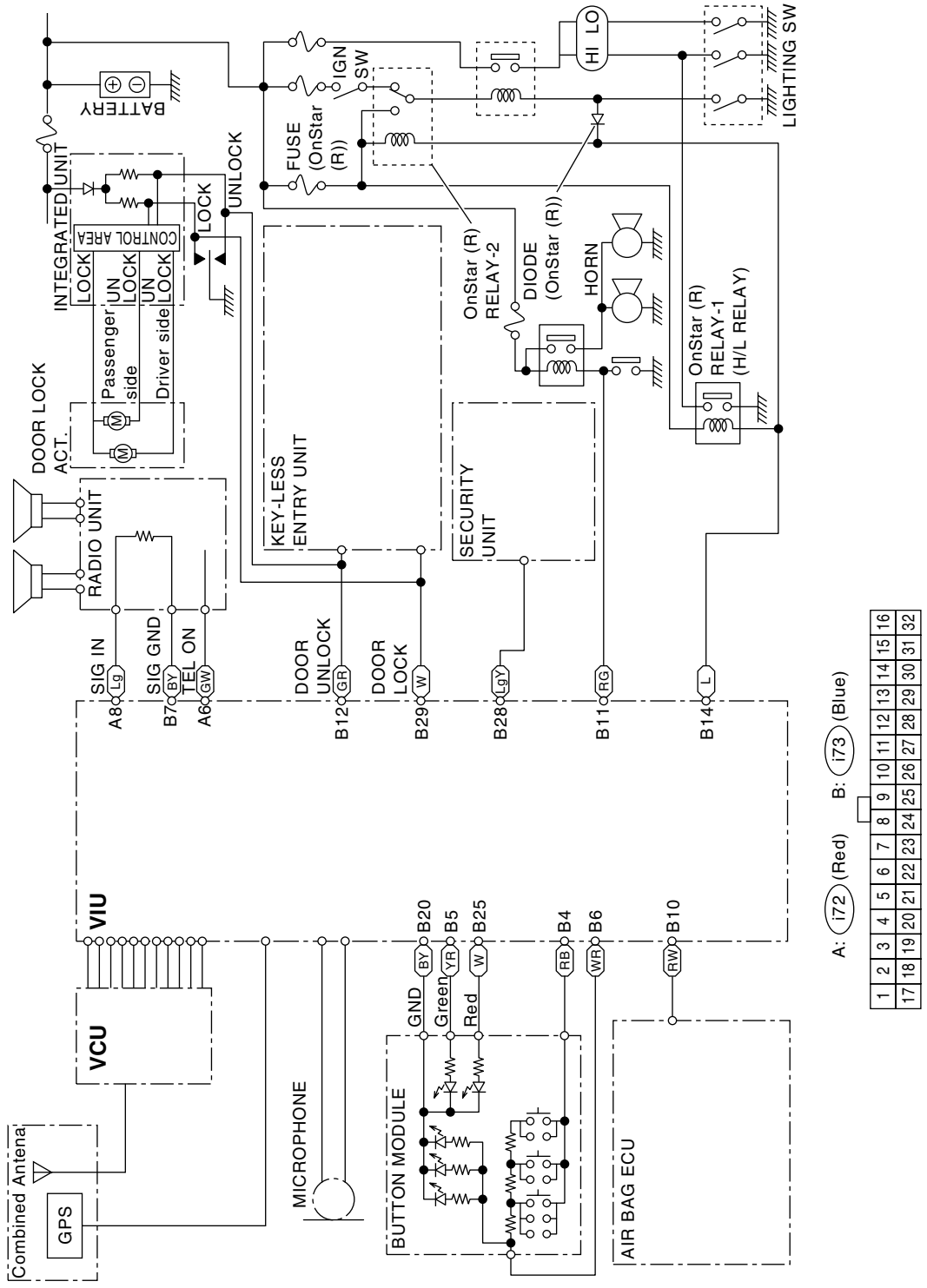


(1) VIU
(2) Connect to i73 (Blue) connector
(3) Connect to i72 (Red) connector
(4) GPS antenna connector

CONTROL MODULE I/O SIGNAL

Contents		Connector No.	Terminal No.	Input/Output signal
Power supply	Power	i73	16	9 — 16 V
	Power	i73	32	9 — 16 V
	GND	i73	1	0 V
	GND	i73	17	0 V
	ACC	i73	27	OnStar (R) activates, when the value is greater than 5.5 V
	IGN	i73	22	OnStar (R) activates, when the value is greater than 5.5 V
VCU I/O	Audio ground	i72	10	0 V
	Audio signal	i72	11	4.5 V when switch is ON
	Audio signal	i72	12	Battery voltage when switch is ON
	Microphone GND	i72	13	0 V when switch is ON
	Microphone input siganal	i72	14	Signal
	Power	i72	16	Battery voltage when switch is ON
	3 wire signal data bus	i72	27	Signal
	3 wire signal data bus	i72	28	Signal
	3 wire signal data bus	i72	29	Signal
Vehicle discrete interface	Door unlock signal	i73	12	At actuation of door unlock Battery voltage
	Door lock signal	i73	29	At actuation of door lock Battery voltage
	Horn signal	i73	11	0V at actuation of horn Battery voltage at no actuation of horn
	Security signal	i73	28	Signal (5 V)
	Headlight signal	i73	14	0V at actuation of headlight Battery voltage at no actuation of headlight
	Low reference of transceiver	i72	30	0 V
	IGN signal	i72	31	Battery voltage when switch is ON
User interface	Mike signal & power supply	i72	25	Signal
	Mike return	i72	26	0 V
	Key pad signal	i73	4	2.14V at pressing emergency button 1.27V at pressing OnStar (R) button 1.27V at pressing call answer/end button
	LED Green	i73	5	3V when LED illuminates
	LED Red	i73	25	2.5V when LED illuminates
	Key pad low reference	i73	20	0 V
	Key pad power supply	i73	6	Battery voltage
Audio output interface	Audio	i72	8	Signal
	Audio GND	i73	7	0 V
	TEL ON signal	i72	6	Battery voltage when switch is ON

B: SCHEMATIC

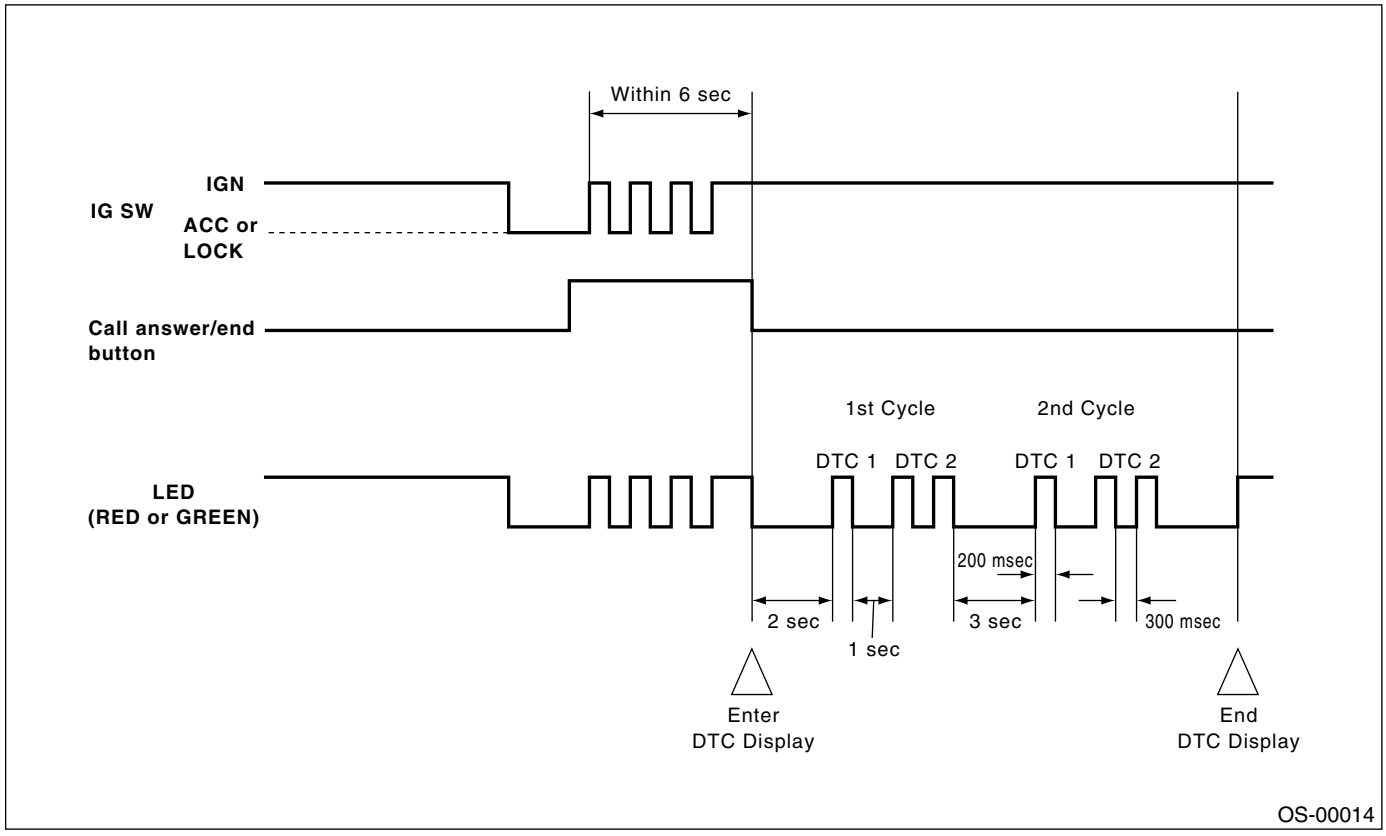


OS-00013

5. Read Diagnostic Trouble Code (DTC)

A: OPERATION

1) Turn ignition switch to OFF.
2) Perform the following job steps within 6 seconds.
3) Change the ignition switch from ON to OFF 3 times with pressing call answer/end button.
4) Turn ignition to ON at the 4th switching action.
5) When the call answer/end button is released, LED will blink to indicate DTC.



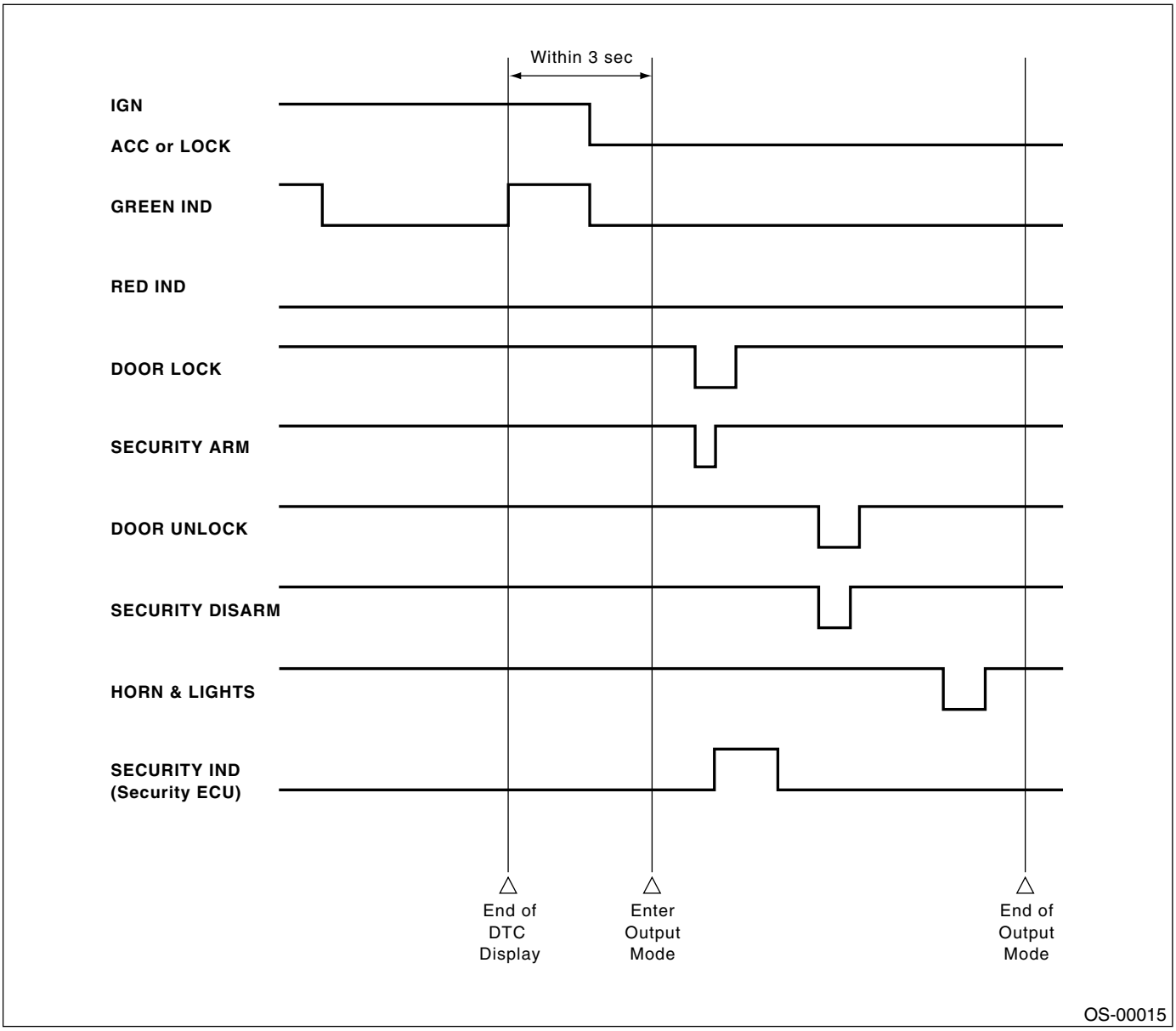
NOTE:
- Current DTC will be indicated by the red LED.
- Former DTC will be indicated by the green LED.
- Current DTC will be indicated first, and then former DTC will be indicated.
- DTC will be displayed in order of numerical sequence from smallest.
- DTC will be indicated in 2 times.

6. Output Mode

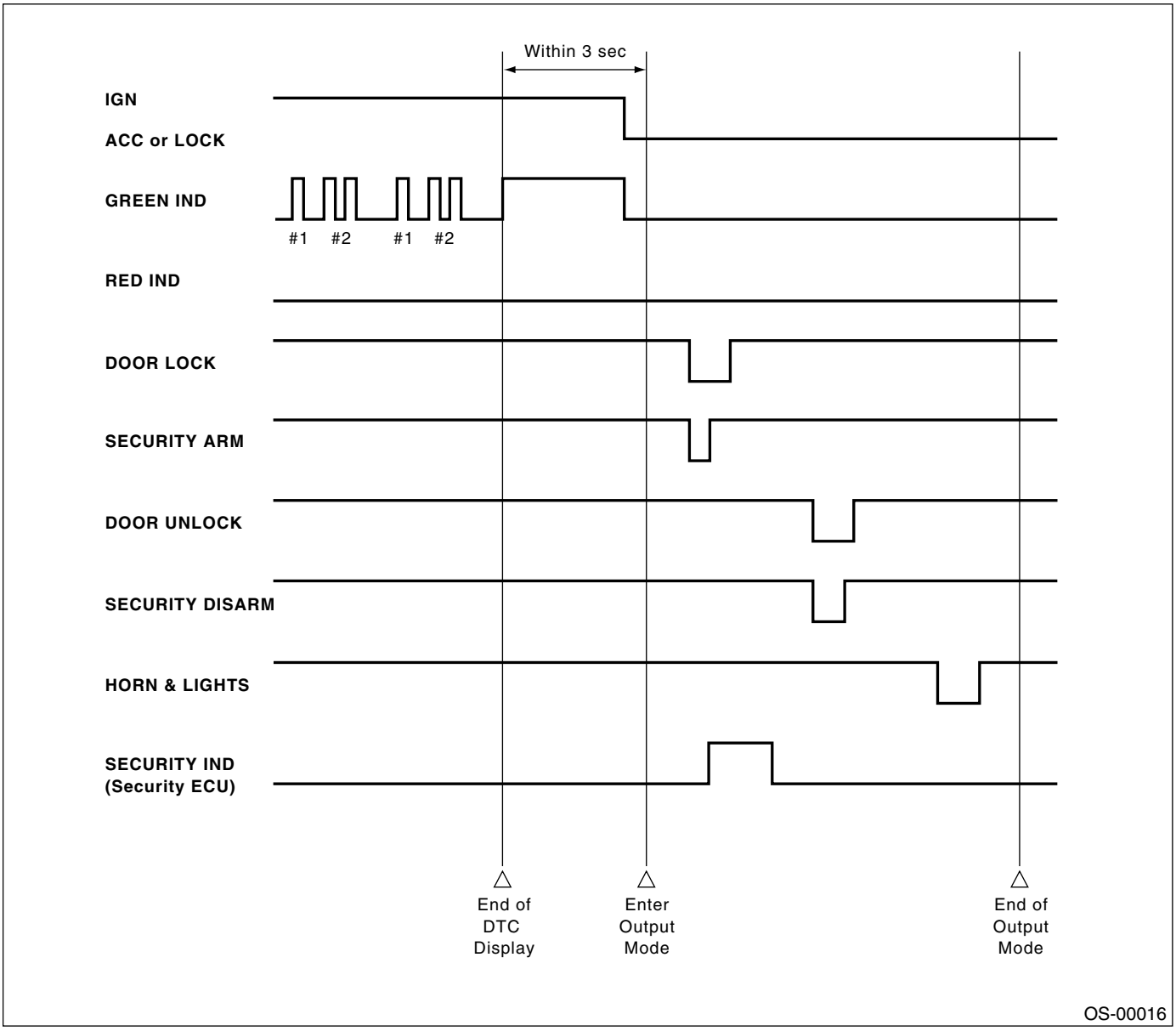
A: OPERATION

NOTE:
Output mode activates lock and unlock of door, security, horn and headlight.

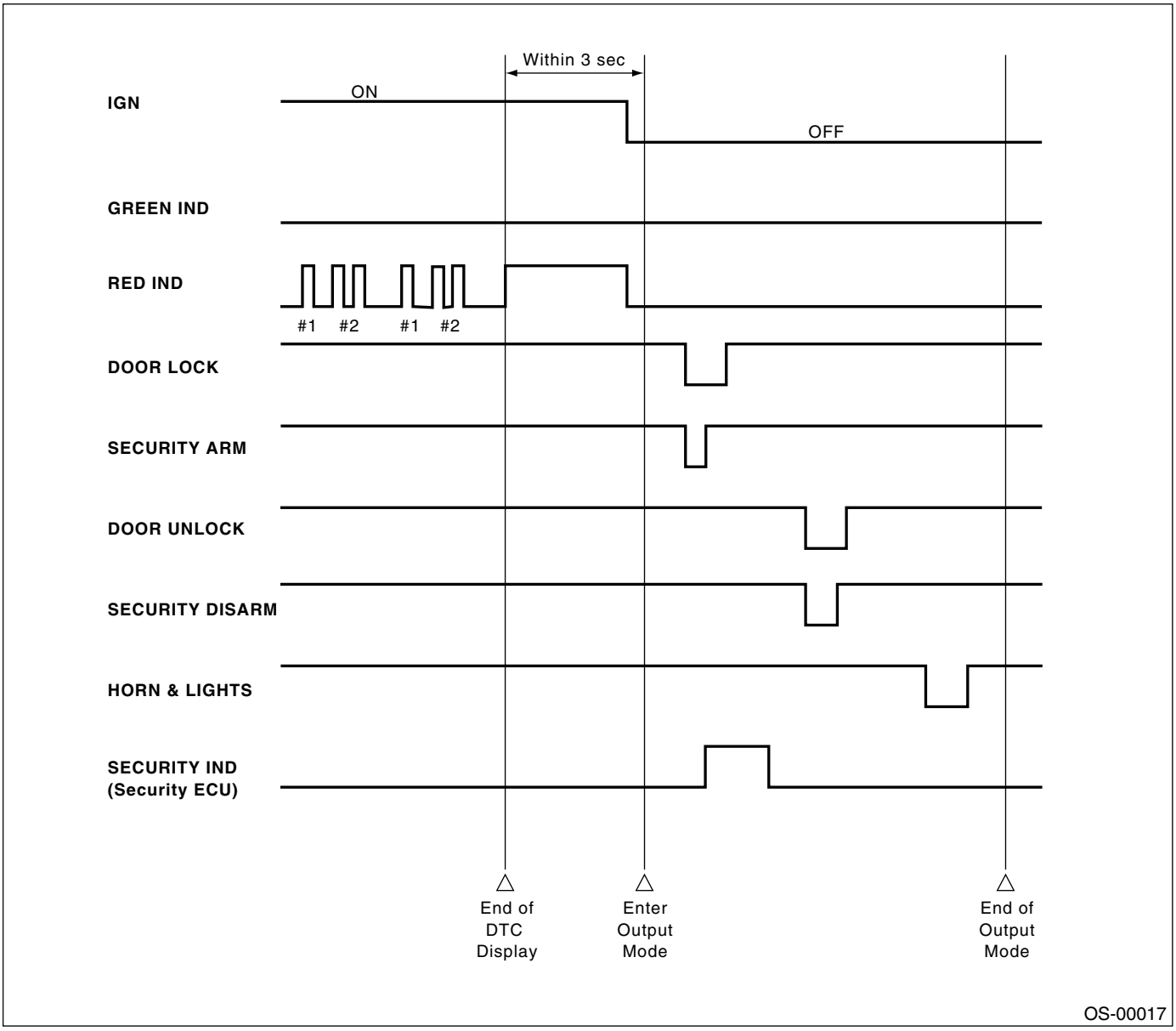
1) Within 3 seconds after reading DTC, turn the ignition to OFF.
- When no DTC is stored



- When DTC of former trouble is stored



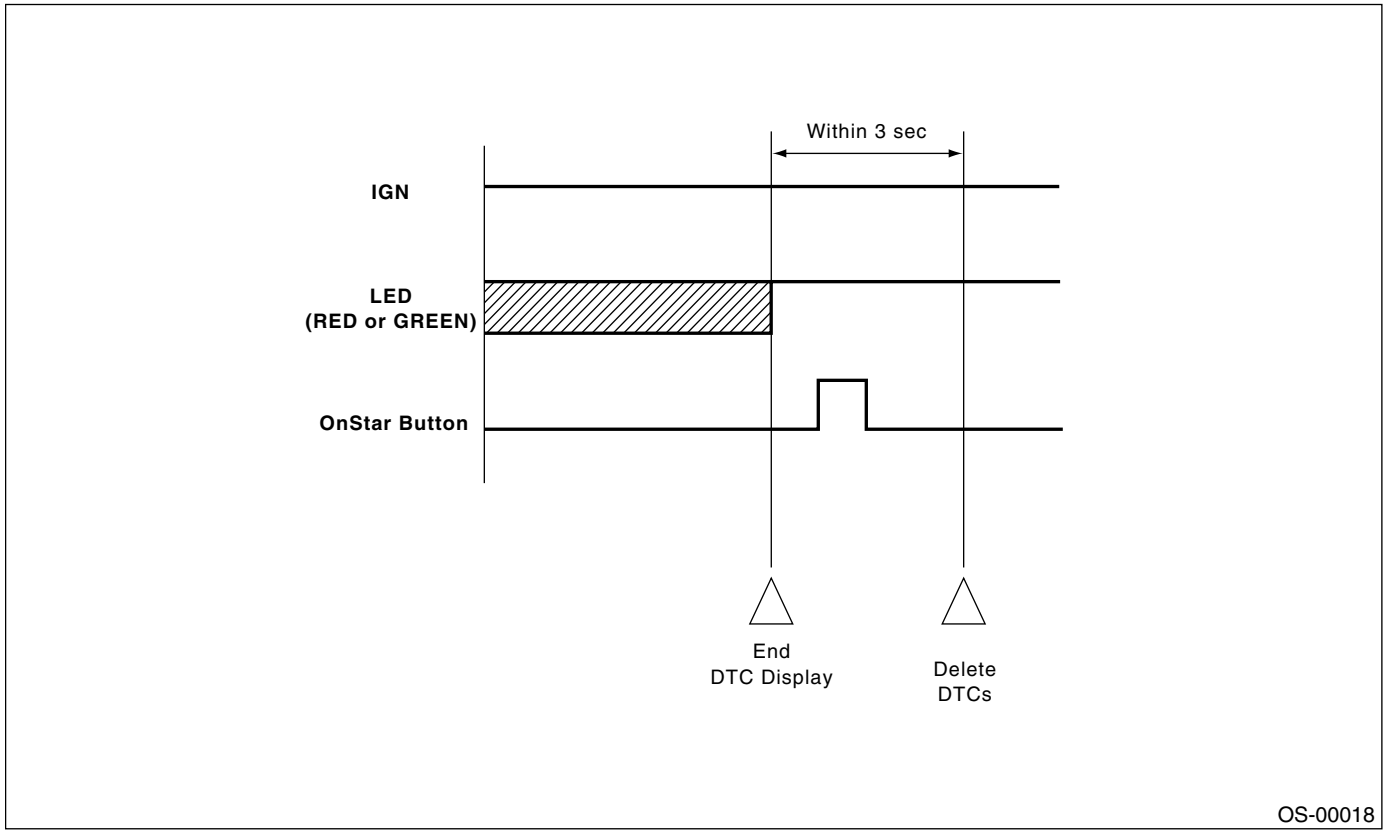
- When DTC of current trouble is stored



7. Clear Memory Mode

A: OPERATION

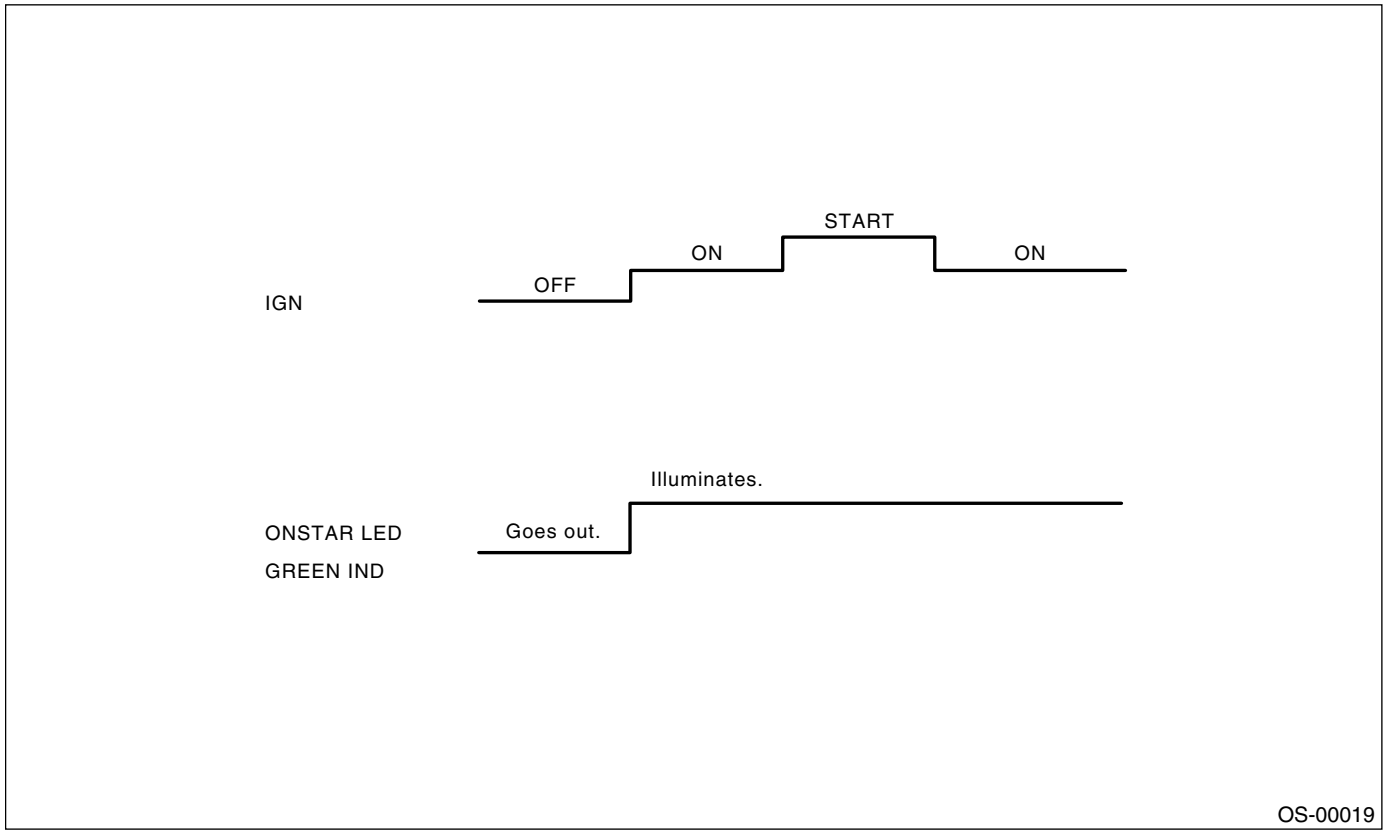
1) Within 3 seconds after reading DTC, turn the OnStar (R) button On and OFF.



8. OnStar (R) LED Illumination Pattern

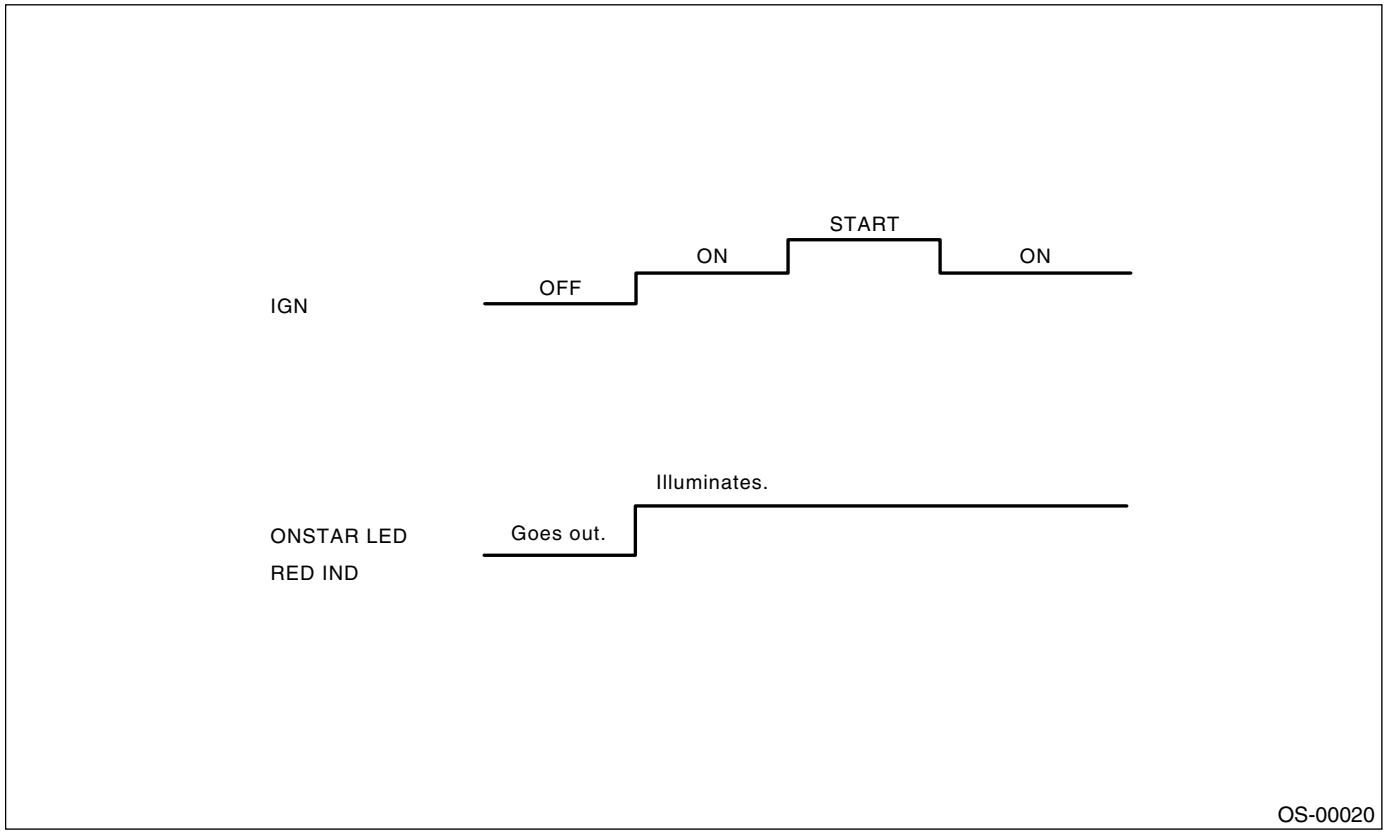
A: INSPECTION

1. LED ILLUMINATES GREEN.



1) There is some trouble in electrical system, when OnStar (R) LED does not come on.
2) Repair OnStar (R) LED circuit or diagnostic circuit, when OnStar (R) LED remains always OFF. <Ref. to OS-48, OnStar (R) LED DOES NOT OPERATE., Diagnosis for Each Symptom.>

2. LED ILLUMINATES RED.



When OnStar (R) LED illuminates in red, it means some trouble exist in OnStar (R) system. In such a case, read DTC and repair. <Ref. to OS-10, OPERATION, Read Diagnostic Trouble Code (DTC).>

9. List of Diagnostic Trouble Code (DTC)

A: LIST

DTC No.	Content of diagnosis	LED indicator pattern	Index No.
0	EEPROM checksum error	No flash	<Ref. to OS-18, DTC 0 — EEPROM CHECKSUM ERROR —, Diagnostics Chart with Trouble Code.>
1	GPS signal error	1 flash	<Ref. to OS-20, DTC 1 — GPS SIGNAL ERROR —, Diagnostics Chart with Trouble Code.>
2	Loss of VCU communication with VIU	2 flashes	<Ref. to OS-22, DTC 2 — LOSS OF VCU COMMUNICATION WITH VIU —, Diagnostics Chart with Trouble Code.>
3	SRS Signal fault	3 flashes	<Ref. to OS-26, DTC 3 — SRS SIGNAL FAULT —, Diagnostics Chart with Trouble Code.>
4	Fault communication between GPS and microprocessor	4 flashes	<Ref. to OS-28, DTC 4 — GPS MICRO-PROCESSOR COMMUNICATION FAULT —, Diagnostics Chart with Trouble Code.>
5	Button assembly malfunction	5 flashes	<Ref. to OS-30, DTC 5 — BUTTON ASSEMBLY MALFUNCTION —, Diagnostics Chart with Trouble Code.>

CAUTION:
When DTC 4, which deactivates button module, VIU will not enter to DTC display mode.

10.Diagnostics Chart with Trouble Code

A: DTC 0 — EEPROM CHECKSUM ERROR —

DIAGNOSIS:
Trouble of EEPROM Checksum
SYMPTOM:

- Red LED illuminates
- OnStar (R) does not operate.

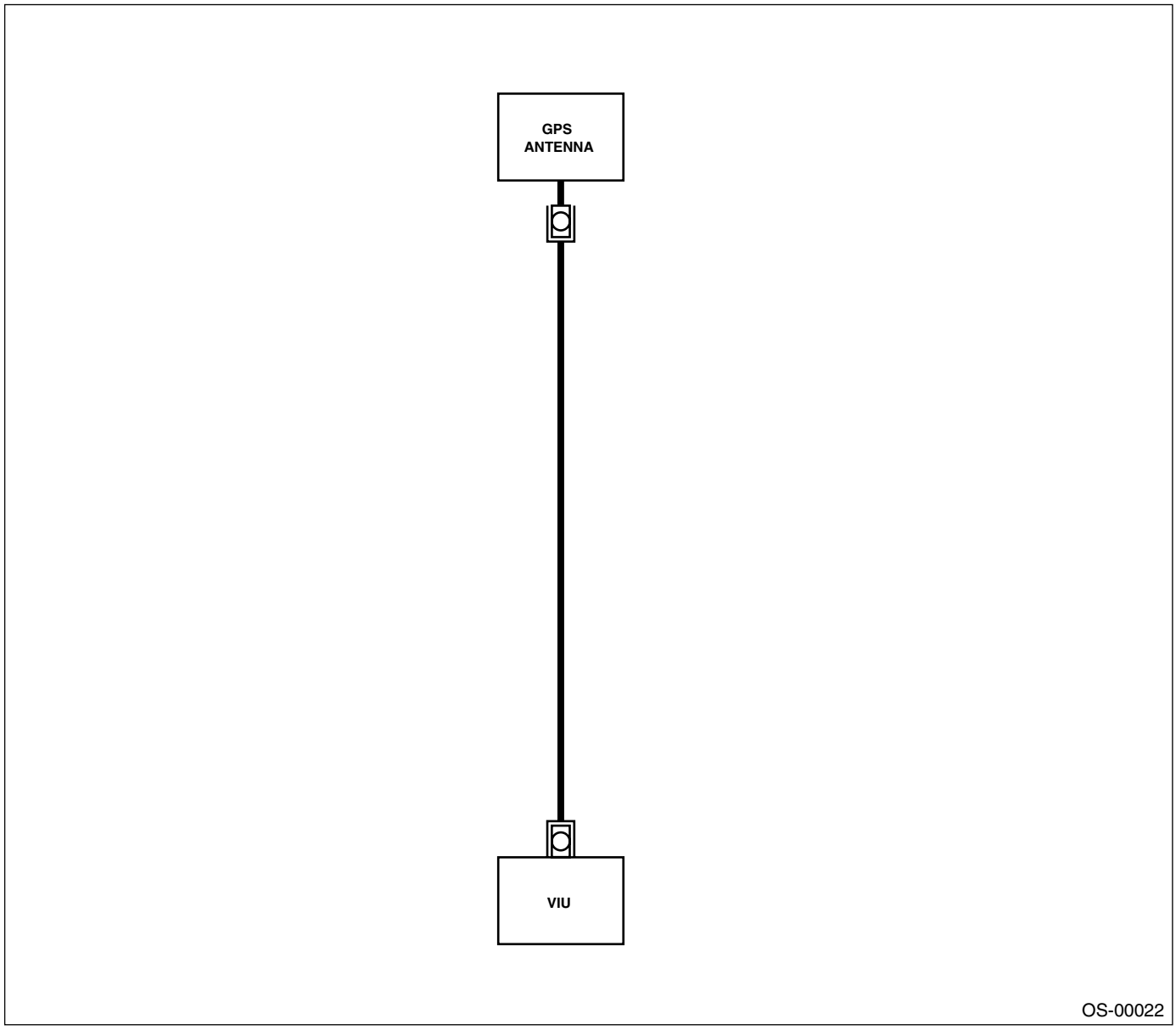
	Step	Check	Yes	No
1	**DTC 5 Check button assembly for malfunction.** <Ref. to OS-30, DTC 5 — BUTTON ASSEMBLY MALFUNCTION —, Diagnostics Chart with Trouble Code.> Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	REFERENCE: Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>

MEMO:

B: DTC 1 — GPS SIGNAL ERROR —

DIAGNOSIS:
Trouble of GPS Signal
SYMPTOM:

- Red LED illuminates
- OnStar (R) does not operate.

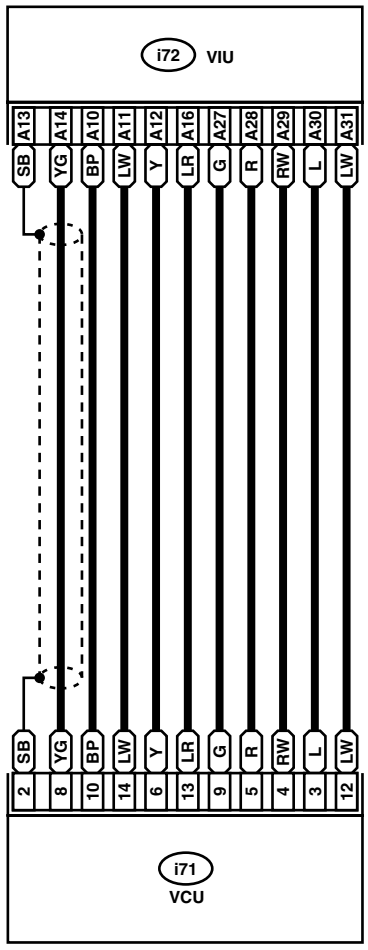


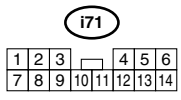
	Step	Check	Yes	No
1	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect GPS antenna connector from VIU. 3) Disconnect connector from GPS antenna. 4) Measure resistance between GPS antenna cables.	Is the measured value less than the 0.5 Ω?	Go to step **2.**	Repair open harness.
2	**CHECK HARNESS.** Measure resistance of GPS antenna cable.	Is the measured value more than 1 MΩ?	Go to step **3.**	Repair ground short of GPS antenna cable.
3	**CHECK HARNESS.** Turn ignition switch to ON. Measure voltage between GPS antenna cable and chassis ground. Does the measured value exceed the specified value?	Is the measured value less than 1 V?	Go to step **4.**	Repair battery short of GPS antenna cable.
4	**CHECK GPS ANTENNA.** 1) Replace GPS antenna. <Ref. to OS-8, Antenna.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	REFERENCE: Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>

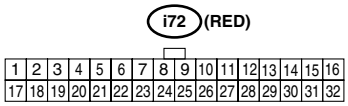
C: DTC 2 — LOSS OF VCU COMMUNICATION WITH VIU —

DIAGNOSIS:
Communication error between VIU and VCU
SYMPTOM:

- Red LED illuminates
- OnStar (R) does not operate.







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	Step	Check	Yes	No
1	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect VCU connector. 4) Measure resistance between VIU connector and VCU connector. ***Connector & Terminal*** ***(i72) No. 10 — (i71) No. 10:*** ***(i72) No. 11 — (i71) No. 14:*** ***(i72) No. 12 — (i71) No. 6:*** ***(i72) No. 13 — (i71) No. 2:*** ***(i72) No. 14 — (i71) No. 8:*** ***(i72) No. 16 — (i71) No. 13:*** ***(i72) No. 27 — (i71) No. 9:*** ***(i72) No. 28 — (i71) No. 5:*** ***(i72) No. 29 — (i71) No. 4:*** ***(i72) No. 30 — (i71) No. 3:*** ***(i72) No. 31 — (i71) No. 12:***	Is the measured value less than 0.5 Ω?	Go to step **2.**	Repair open harness.
2	**CHECK HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 10 — Chassis ground:*** ***(i72) No. 11 — Chassis ground:*** ***(i72) No. 12 — Chassis ground:*** ***(i72) No. 13 — Chassis ground:*** ***(i72) No. 14 — Chassis ground:*** ***(i72) No. 16 — Chassis ground:*** ***(i72) No. 27 — Chassis ground:*** ***(i72) No. 28 — Chassis ground:*** ***(i72) No. 29 — Chassis ground:*** ***(i72) No. 30 — Chassis ground:*** ***(i72) No. 31 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **3.**	Repair ground short of harness.
3	**CHECK HARNESS.** 1) Turn ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 10 (+) — Chassis ground (–):*** ***(i72) No. 11 (+) — Chassis ground (–):*** ***(i72) No. 12 (+) — Chassis ground (–):*** ***(i72) No. 13 (+) — Chassis ground (–):*** ***(i72) No. 14 (+) — Chassis ground (–):*** ***(i72) No. 16 (+) — Chassis ground (–):*** ***(i72) No. 27 (+) — Chassis ground (–):*** ***(i72) No. 28 (+) — Chassis ground (–):*** ***(i72) No. 29 (+) — Chassis ground (–):*** ***(i72) No. 30 (+) — Chassis ground (–):*** ***(i72) No. 31 (+) — Chassis ground (–):***	Is the measured value less than 1 V?	Go to step **4.**	Repair battery short of harness.
4	**CHECK VOLTAGE OF POWER SUPPLY.** 1) Turn ignition switch to OFF. 2) Connect connector of VIU and VCU. 3) Turn the ignition switch to ON. 4) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 10 (+) — Chassis ground (–):***	Is the measured value 0 V?	Go to step **5.**	Go to step **11.**

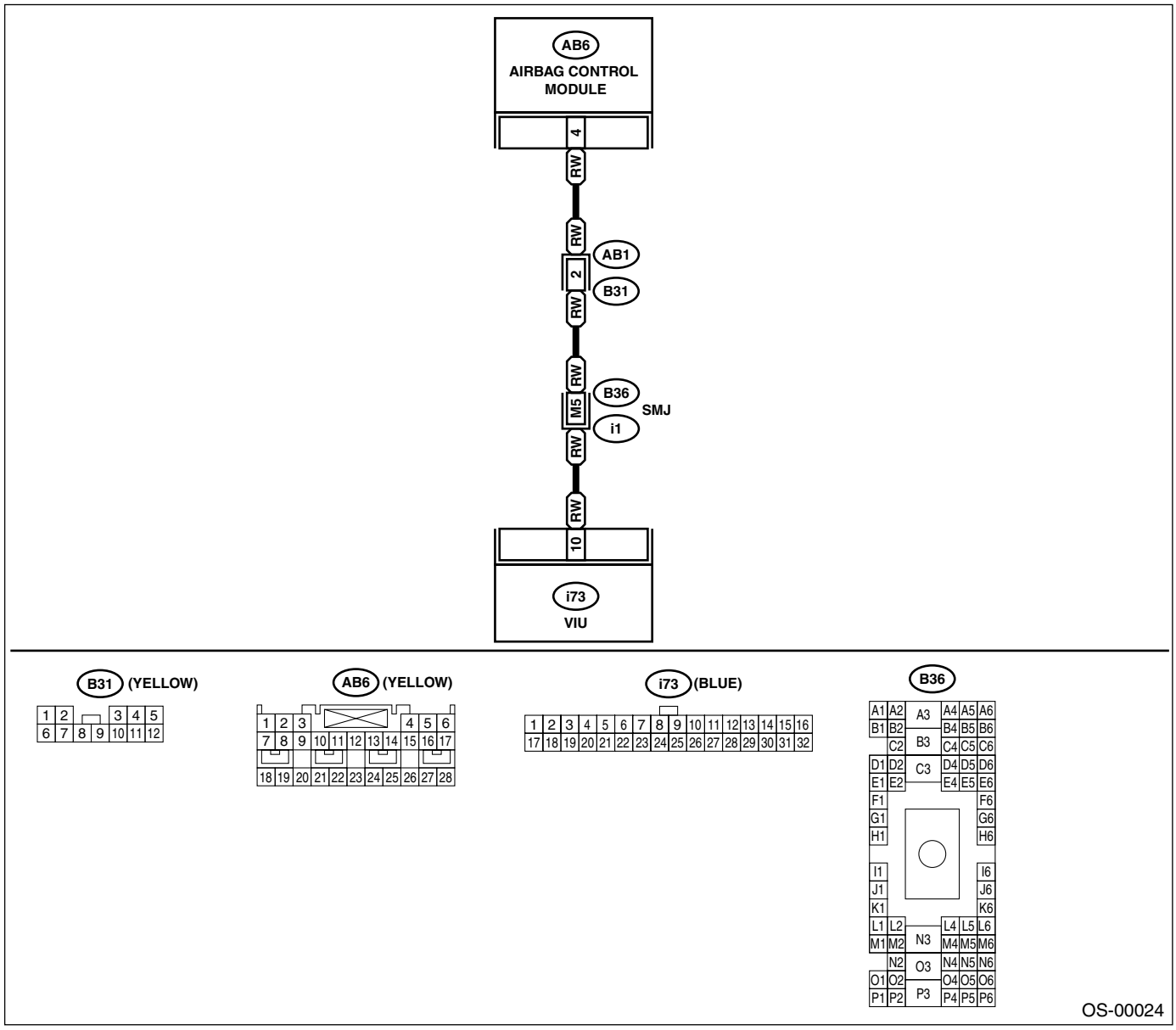
Step		Check	Yes	No
5	**CHECK VOLTAGE OF POWER SUPPLY.** Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 11 (+) — Chassis ground (–):***	Is the measured value 3.0 to 5.0 V?	Go to step **6.**	Go to step **11.**
6	**CHECK VOLTAGE OF POWER SUPPLY.** Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 12 (+) — Chassis ground (–):***	Is the measured value 9 to 16 V?	Go to step **7.**	Go to step **11.**
7	**CHECK VOLTAGE OF POWER SUPPLY.** Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 16 (+) — Chassis ground (–):***	Is the measured value 9 to 16 V?	Go to step **8.**	Go to step **11.**
8	**CHECK VOLTAGE OF POWER SUPPLY.** Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 31 (+) — Chassis ground (–):***	Is the measured value 9 to 16 V?	Go to step **9.**	Go to step **11.**
9	**CHECK VCU HARNESS CONNECTOR.** Check if there is any poor contact in VCU harness connector.	Is there any poor contact in connector?	Go to step **10.**	Repair poor contact in connector.
10	**CHECK VCU.** IMPORTANT Perform OnStar (R) setup procedure. Replace VCU. <Ref. to OS-5, Vehicle Communication Unit VCU.>	Was the trouble repaired?	System is OK.	Go to step **11.**
11	**CHECK VIU HARNESS CONNECTOR.** Check if there is any poor contact in VIU harness connector.	Is there any poor contact in connector?	Go to step **12.**	Repair poor contact in connector.
12	**CHECK VIU.** IMPORTANT Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>	Was the trouble repaired?	System is OK.	Go to step **1.**

MEMO:

D: DTC 3 — SRS SIGNAL FAULT —

DIAGNOSIS:
Communication error between VIU and SRS.
SYMPTOM:

- Red LED illuminates
- OnStar (R) does not operate.



	Step	Check	Yes	No
1	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect SRS connector. 4) Measure resistance between VIU connector and SRS connector. ***Connector & Terminal*** ***(i73) No. 10 — (AB6) No. 4:***	Is the measured value less than the 0.5 Ω?	Go to step **2.**	Repair open harness.
2	**CHECK HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 10 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **3.**	Repair ground short of harness.
3	**CHECK HARNESS.** 1) Turn ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 10 (+) — Chassis ground (–):***	Is the measured value less than 1 V?	Go to step **4.**	Repair battery short of harness.
4	**CHECK VOLTAGE OF POWER SUPPLY.** 1) Turn ignition switch to OFF. 2) Connect VIU connector. 3) Turn the ignition switch to ON. 4) Measure resistance between SRS connector and chassis ground. ***Connector & Terminal*** ***(AB6) No. 4 (+) — Chassis ground (–):***	Is the measured value 9 to 16 V?	Go to step **5.**	Go to step **6.**
5	**CHECK AIRBAG CONTROL MODULE.** 1) Replace airbag control module. <Ref. to AB-18, Airbag Control Module.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **6.**
6	**CHECK VIU.** REFERENCE: Perform OnStar (R) setup procedure. 1) Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**

E: DTC 4 — GPS MICRO-PROCESSOR COMMUNICATION FAULT —

DIAGNOSIS:
Trouble of GPS micro-processor in VIU
SYMPTOM:

- Red LED illuminates
- OnStar (R) does not operate.

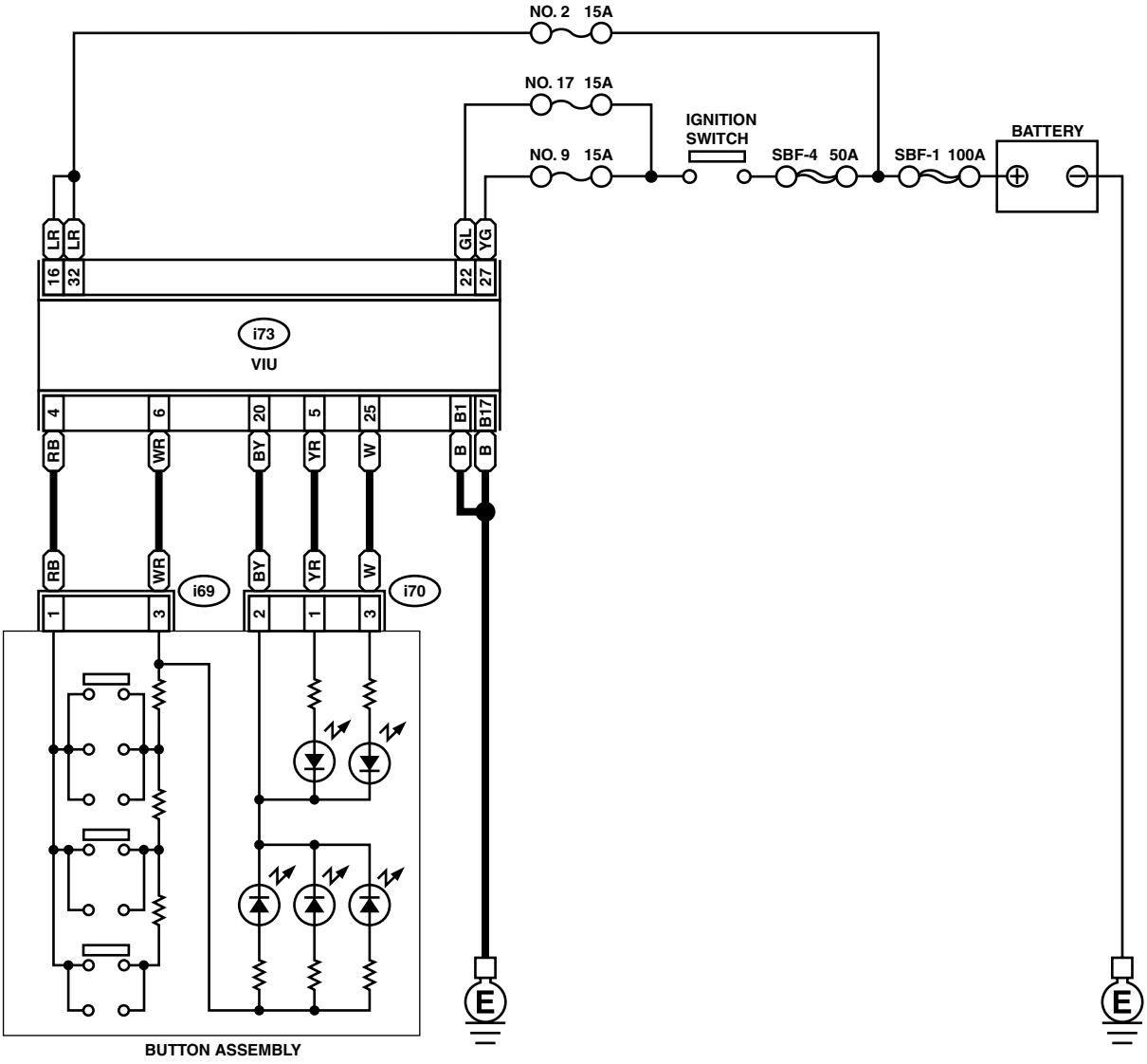
	Step	Check	Yes	No
1	**CHECK VIU.** REFERENCE: Perform OnStar (R) setup procedure. 1) Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Repair trouble.

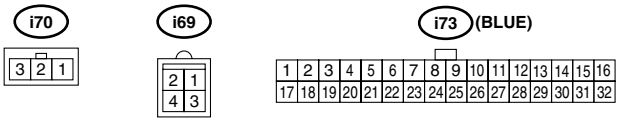
MEMO:

F: DTC 5 — BUTTON ASSEMBLY MALFUNCTION —

DIAGNOSIS:
Communication error of button assembly
SYMPTOM:

- Red LED illuminates
- OnStar (R) does not operate.





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	Step	Check	Yes	No
1	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect button assembly connector. 4) Measure resistance between VIU connector and button assembly connector. ***Connector & Terminal*** ***(i73) No. 4 — (i69) No. 1:*** ***(i73) No. 6 — (i69) No. 3:*** ***(i73) No. 20 — (i70) No. 2:*** ***(i73) No. 5 — (i70) No. 1:*** ***(i73) No. 25 — (i70) No. 3:***	Is the measured value less than 0.5 Ω?	Go to step **2.**	Repair open harness.
2	**CHECK HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 4 — Chassis ground:*** ***(i73) No. 6 — Chassis ground:*** ***(i73) No. 20 — Chassis ground:*** ***(i73) No. 5 — Chassis ground:*** ***(i73) No. 25 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **2.**	Repair ground short of harness.
3	**CHECK HARNESS.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 4 (+) — Chassis ground (–):*** ***(i73) No. 6 (+) — Chassis ground (–):*** ***(i73) No. 20 (+) — Chassis ground (–):*** ***(i73) No. 5 (+) — Chassis ground (–):*** ***(i73) No. 25 (+) — Chassis ground (–):***	Is the measured value less than 1 V?	Go to step **4.**	Repair battery short of harness.
4	**CHECK VOLTAGE OF POWER SUPPLY.** 1) Turn ignition switch to OFF. 2) Connect VIU connector. 3) Turn the ignition switch to ON. 4) Measure voltage between button assembly connector and chassis ground. ***Connector & Terminal*** ***(i69) No. 3 (+) — Chassis ground (–):***	Is the measured value within the 10 to 13 V?	Go to step **5.**	REFERENCE: Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>
5	**CHECK EMERGENCY BUTTON.** Measure resistance between terminals of button assembly. ***Terminal*** ***No. 1 — No. 3:***	Is the measured value 1.5 KΩ by pressing emergency button?	Go to step **6.**	Replace button assembly. <Ref. to OS-6, Button Assembly.>
6	**OnStar (R) CHECK BUTTON.** Measure resistance between terminals of button assembly. ***Terminal*** ***No. 1 — No. 3:***	Is the measured value 3.0 KΩ by pressing OnStar (R) button?	Go to step **7.**	Replace button assembly. <Ref. to OS-6, Button Assembly.>
7	**CHECK CALL ANSWER/END BUTTON.** Measure resistance between terminals of button assembly. ***Terminal*** ***No. 1 — No. 3:***	Is the measured value 13.0 KΩ by pressing call answer/end button?	Go to step **8.**	Replace button assembly. <Ref. to OS-6, Button Assembly.>
8	**System check** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **9.**

Step		Check	Yes	No
9	**CHECK BUTTON ASSEMBLY.** 1) Replace button assembly. <Ref. to OS-6, Button Assembly.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **10.**
10	**CHECK VIU.** REFERENCE: Perform OnStar (R) setup procedure. 1) Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**

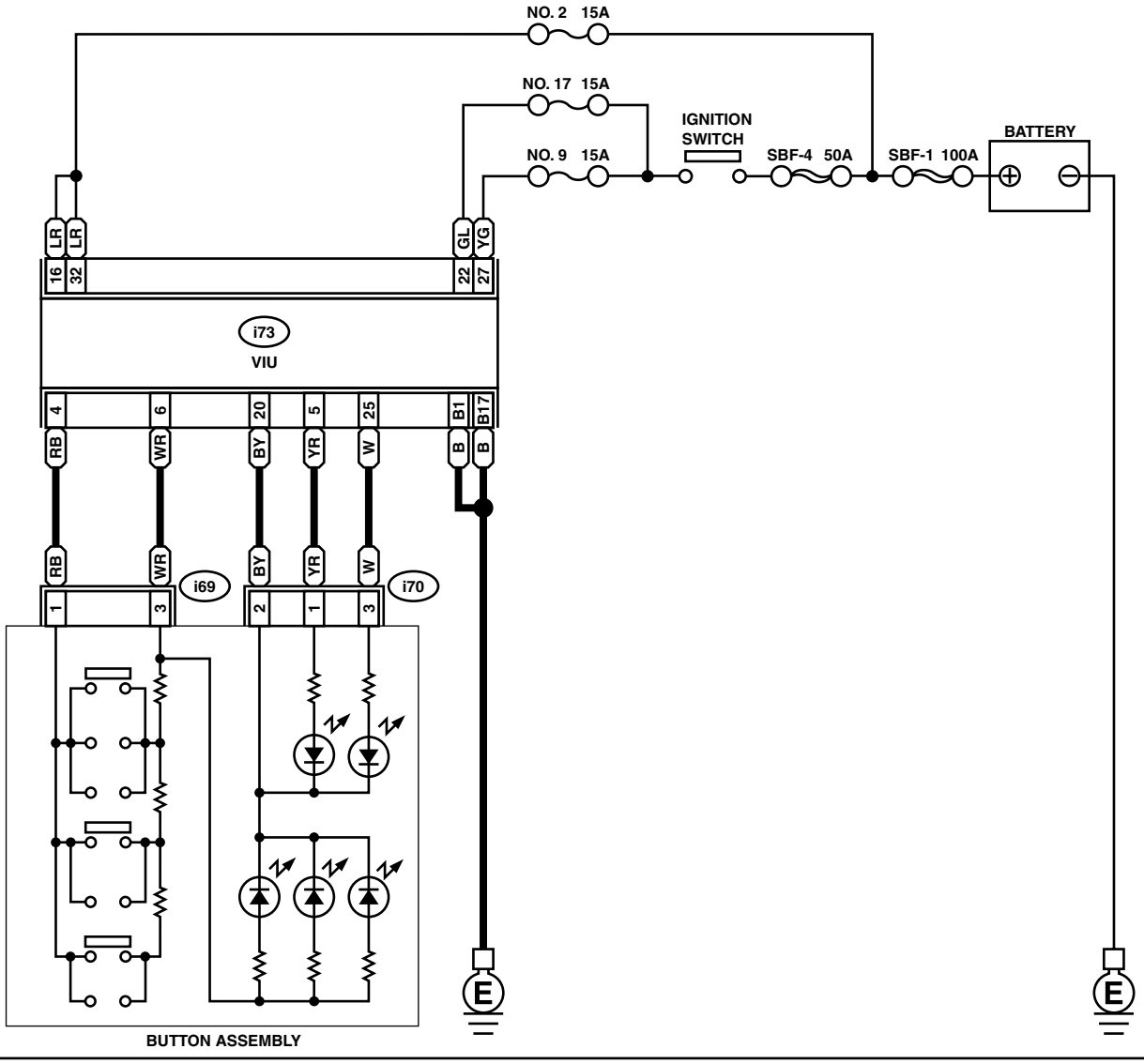
11.Diagnosis for Each Symptom

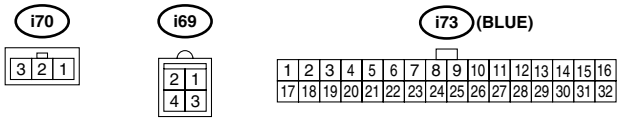
A: LIST

Content of diagnosis	Index No.
One or more OnStar (R) buttons do not operate.	<Ref. to OS-34, ONE OR MORE OnStar (R) BUTTONS DO NOT OPERATE., Diagnosis for Each Symptom.>
Contact to OnStar (R) call center is impossible.	<Ref. to OS-38, CONTACT TO OnStar (R) CALL CENTER IS IMPOSSIBLE., Diagnosis for Each Symptom.>
OnStar (R) call center cannot setup OnStar (R) system.	<Ref. to OS-42, OnStar (R) CALL CENTER CANNOT SETUP OnStar (R) SYSTEM., Diagnosis for Each Symptom.>
OnStar (R) audio does not operate.	<Ref. to OS-44, OnStar (R) AUDIO DOES NOT OPERATE., Diagnosis for Each Symptom.>
OnStar (R) button LED does not operate.	<Ref. to OS-48, OnStar (R) LED DOES NOT OPERATE., Diagnosis for Each Symptom.>

B: ONE OR MORE ONSTAR (R) BUTTONS DO NOT OPERATE.

DEFINITION: OnStar (R) does not operate by pressing button.





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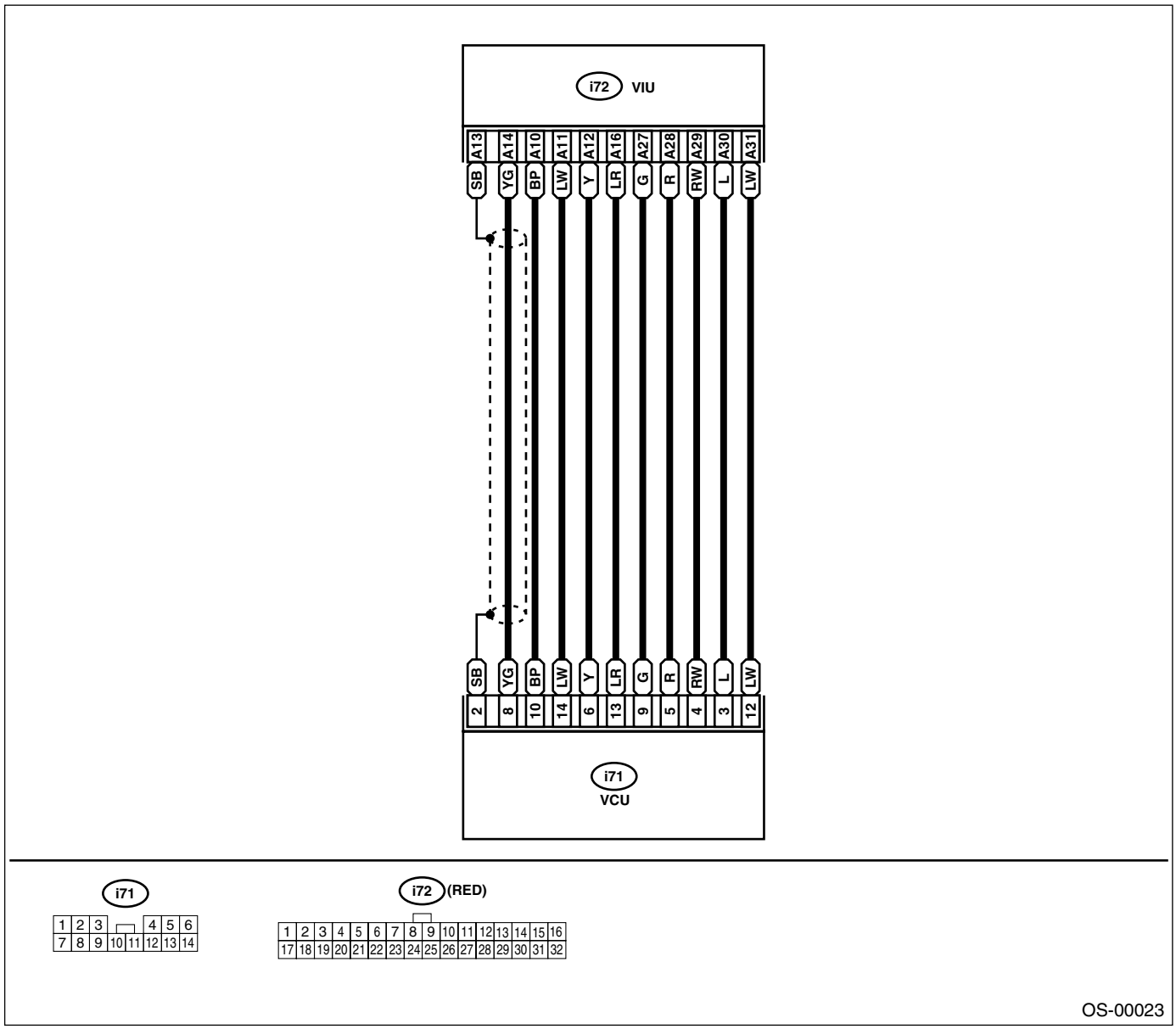
	Step	Check	Yes	No
1	**CHECK BUTTON ASSEMBLY.** IMPORTANT Before pressing button, call OnStar (R) call center to notify the inspection. 1) Turn ignition switch to ON (do not let the engine run). 2) Press each OnStar (R) button.	Does the LED illuminate in green?	Go to step **3.**	Go to step **2.**
2	**CHECK BUTTON.**	Does any button malfunction intermittently?	Go to step **7.**	Poor contact of connection/Repair poor contact.
3	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect button assembly connector. 4) Measure resistance between VIU connector and button assembly connector. ***Connector & Terminal*** ***(i73) No. 4 — (i69) No. 1:*** ***(i73) No. 6 — (i69) No. 3:***	Is the measured value less than 0.5 Ω?	Go to step **4.**	Repair open harness.
4	**CHECK HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 4 (+) — Chassis ground (–):*** ***(i73) No. 6 (+) — Chassis ground (–):***	Is the measured value more than 1 MΩ?	Go to step **5.**	Repair ground short of harness.
5	**CHECK HARNESS.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 4 (+) — Chassis ground (–):*** ***(i73) No. 6 (+) — Chassis ground (–):***	Is the measured value less than 1 V?	Go to step **6.**	Repair battery short of harness.
6	**CHECK VOLTAGE OF POWER SUPPLY.** 1) Turn ignition switch to OFF. 2) Connect VIU connector. 3) Turn the ignition switch to ON. 4) Measure voltage between button assembly connector and chassis ground. ***Connector & Terminal*** ***(i69) No. 3 (+) — Chassis ground (–):***	Is the measured value within 9 to 16 V?	Go to step **7.**	REFERENCE: Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>
7	**CHECK EMERGENCY BUTTON.** Measure resistance between terminals of button assembly. ***Terminal*** ***No. 1 —No. 3:***	Is the measured value 3.0 KΩ by pressing emergency button?	Go to step **8.**	Replace button assembly. <Ref. to OS-6, Button Assembly.>
8	**CHECK OnStar (R) BUTTON.** Measure resistance between terminals of button assembly. ***Terminal*** ***No. 1 — No. 3:***	Is the measured value 13.0 KΩ by pressing OnStar (R) button?	Go to step **9.**	Replace button assembly. <Ref. to OS-6, Button Assembly.>
9	**CHECK CALL ANSWER/END BUTTON.** Measure resistance between terminals of button assembly. ***Terminal*** ***No. 1 — No. 3:***	Is the measured value 470 Ω by pressing call answer/end button?	Go to step **10.**	Replace button assembly. <Ref. to OS-6, Button Assembly.>
10	**CHECK POOR CONNECTION OF BUTTON ASSEMBL.** Check, if there is any poor contact in harness connector of button assembly.	Was the condition confirmed or repaired?	Go to step **12.**	Go to step **11.**

	Step	Check	Yes	No
11	**CHECK IF THERE IS ANY POOR CONTACT IN VIU HARNESS CONNECTOR.**	Was the condition confirmed or repaired?	Go to step **12.**	Go to step **13.**
12	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **13.**
13	**CHECK BUTTON ASSEMBLY.** 1) Replace button assembly. <Ref. to OS-6, Button Assembly.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **14.**
14	**CHECK VIU.** REFERENCE: Perform OnStar (R) setup procedure. 1) Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.> 2) Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**

MEMO:

C: CONTACT TO ONSTAR (R) CALL CENTER IS IMPOSSIBLE.

DEFINITION: When OnStar (R) call button is pressed, audio prompt “Connected to OnStar (R)” or “Impossible to connect to OnStar (R)” will be announced and connection is not performed.



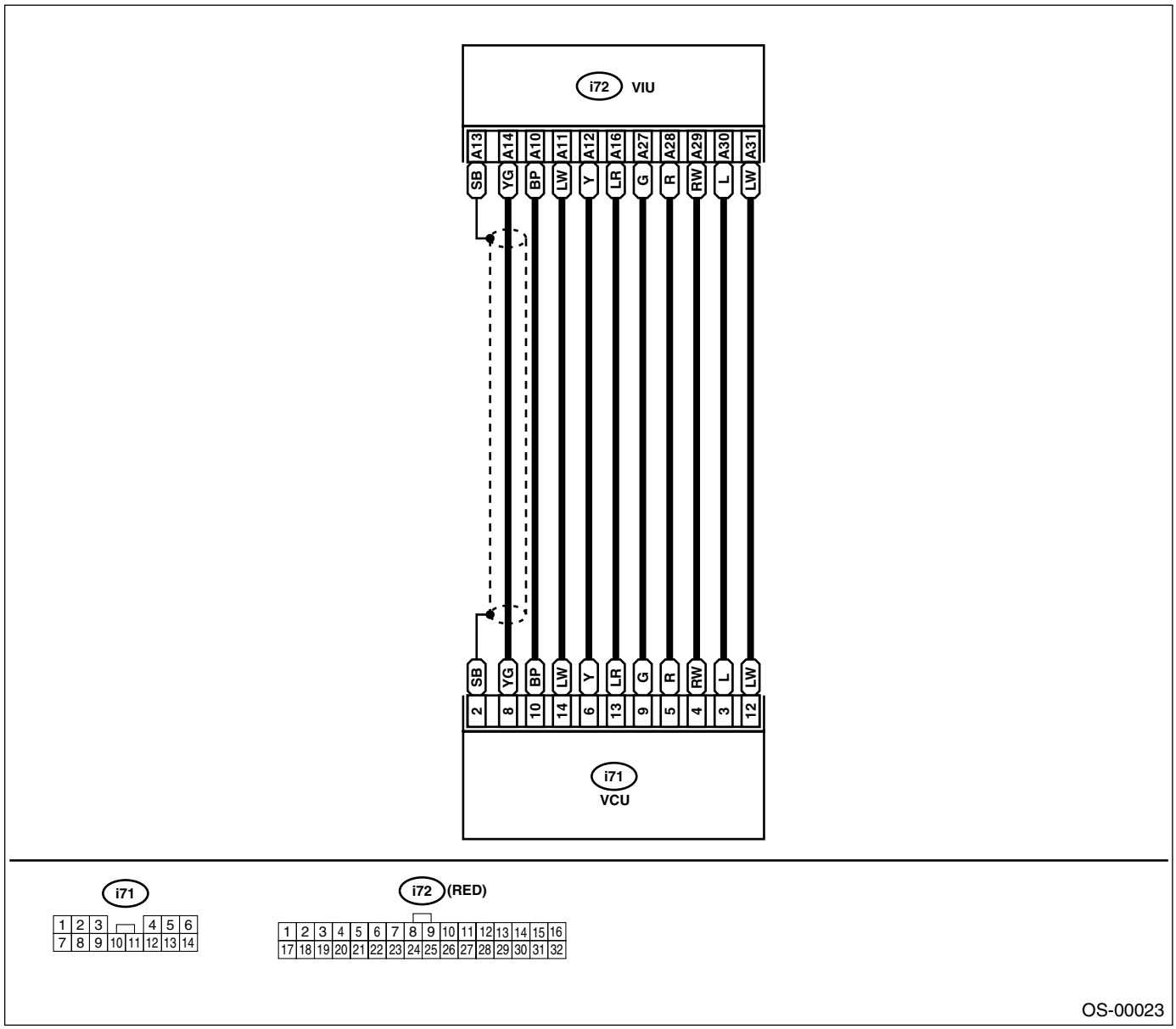
	Step	Check	Yes	No
1	**CHECK FOR CONNECTION TO OnStar (R) Call Center.** 1) Turn ignition to ON (do not let the engine run). 2) Press OnStar (R) button.	Is connection to OnStar (R) call center completed?	Repair temporary poor connection of wiring.	Go to step **2.**
2	**CHECK OnStar (R) SERIAL DATA RETURN CIRCUIT.** 1) Turn ignition switch to OFF. 2) Disconnect connection from vehicle communication unit (VCU). 3) Turn ignition switch to ON (do not let the engine run). 4) Measure resistance between OnStar (R) serial data return circuit and ground. ***Connector & Terminal*** ***(i71) No. 9 (+) — Chassis ground (–):***	Is the measured value approx. 5 V?	Go to step **3.**	Go to step **6.**
3	**CHECK OnStar (R) SERIAL DATA (–) CIRCUIT.** Measure voltage between OnStar (R) serial data (–) circuit and ground. ***Connector & Terminal*** ***(i71) No. 5 (+) — Chassis ground (–):***	Is the measured value approx. 0.17 V?	Go to step **4.**	Go to step **9.**
4	**CHECK CIRCUIT BETWEEN OnStar (R) SERIAL DATA (–) CIRCUIT AND TRANSCEIVER LOW REFEFERENCE CIRCUIT.** Measure voltage between OnStar (R) serial data (–) circuit and transceiver low reference circuit. ***Connector & Terminal*** ***(i71) No. 5 (+) — (i71) No. 3 (–):***	Is the measured value approx. 5 V?	Go to step **5.**	Go to step **15.**
5	**CHECK OnStar (R) SERIAL DATA (+) CIRCUIT.** Measure voltage between OnStar (R) serial data (+) circuit and ground. ***Connector & Terminal*** ***(i71) No. 4 (+) — Chassis ground (–):***	Is the measured value approx. 0.17 V?	Go to step **18.**	Go to step **12.**
6	**CHECK SERIAL DATA RETURN HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect VCU connector. 4) Measure resistance between VIU connector and VCU connector. ***Connector & Terminal*** ***(i72) No. 27 — (i71) No. 9:***	Is the measured value less than the 0.5 Ω?	Go to step **7.**	Repair open harness.
7	**CHECK SERIAL DATA RETURN HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 27 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **8.**	Repair ground short of harness.
8	**CHECK SERIAL DATA RETURN HARNESS.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 27 (+) — Chassis ground (–):***	Is the measured value less than 1 V?	Go to step **19.**	Repair battery short of harness.

Step		Check	Yes	No
9	**CHECK HARNESS (–).** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect VCU connector. 4) Measure resistance between VIU connector and VCU connector. ***Connector & Terminal*** ***(i72) No. 28 — (i71) No. 5:***	Is the measured value less than 0.5 Ω?	Go to step **10.**	Repair open harness.
10	**CHECK HARNESS (–).** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 28 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **11.**	Repair ground short of harness.
11	**CHECK HARNESS (–).** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 28 (+) — Chassis ground (–):***	Is the measurede value less than 1 V?	Go to step **19.**	Repair battery short of harness.
12	**CHECK SERIAL DATA (+) HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect VCU connector. 4) Measure resistance between VIU connector and VCU connector. ***Connector & Terminal*** ***(i72) No. 29 — (i71) No. 4:***	Is the measured value less than 0.5 Ω?	Go to step **13.**	Repair open harness.
13	**CHECK SERIAL DATA (+) HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 29 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **14.**	Repair ground short of harness.
14	**CHECK SERIAL DATA (+) HARNESS.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 29 (+) — Chassis ground (–):***	Is the measurede value less than 1 V?	Go to step **19.**	Repair battery short of harness.
15	**CHECK TRANSCEIVER LOW REFERENCE HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect VCU connector. 4) Measure resistance between VIU connector and VCU connector. ***Connector & Terminal*** ***(i72) No. 30 — (i71) No. 3:***	Is the measured value less than 0.5 Ω?	Go to step **16.**	Repair open harness.
16	**CHECK TRANSCEIVER LOW REFERENCE HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 30 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **17.**	Repair ground short of harness.

	Step	Check	Yes	No
17	**CHECK TRANSEAVER LOW REFERENCE HARNESS.** 1) Turn ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 30 (+) — Chassis ground (–):***	Is the measurede value less than 1 V?	Go to step **19.**	Repair battery short of harness.
18	**CHECK VCU HARNESS CONNECTOR.** Check if there is any poor contact in VCU harness connector.	Is there any poor contact in connector?	Go to step **20.**	Repair poor contact in connector.
19	**CHECK VIU HARNESS CONNECTOR.** Check if there is any poor contact in VIU harness connector.	Is there any poor contact in connector?	Go to step **21.**	Repair poor contact in connector.
20	**CHECK VCU.** IMPORTANT Perform OnStar (R) setup procedure. Replace VCU. <Ref. to OS-5, Vehicle Communication Unit VCU.>	—	Go to step **22.**	—
21	**CHECK VIU.** IMPORTANT Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>	—	Go to step **22.**	—
22	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**

D: ONSTAR (R) CALL CENTER CANNOT SETUP ONSTAR (R) SYSTEM.

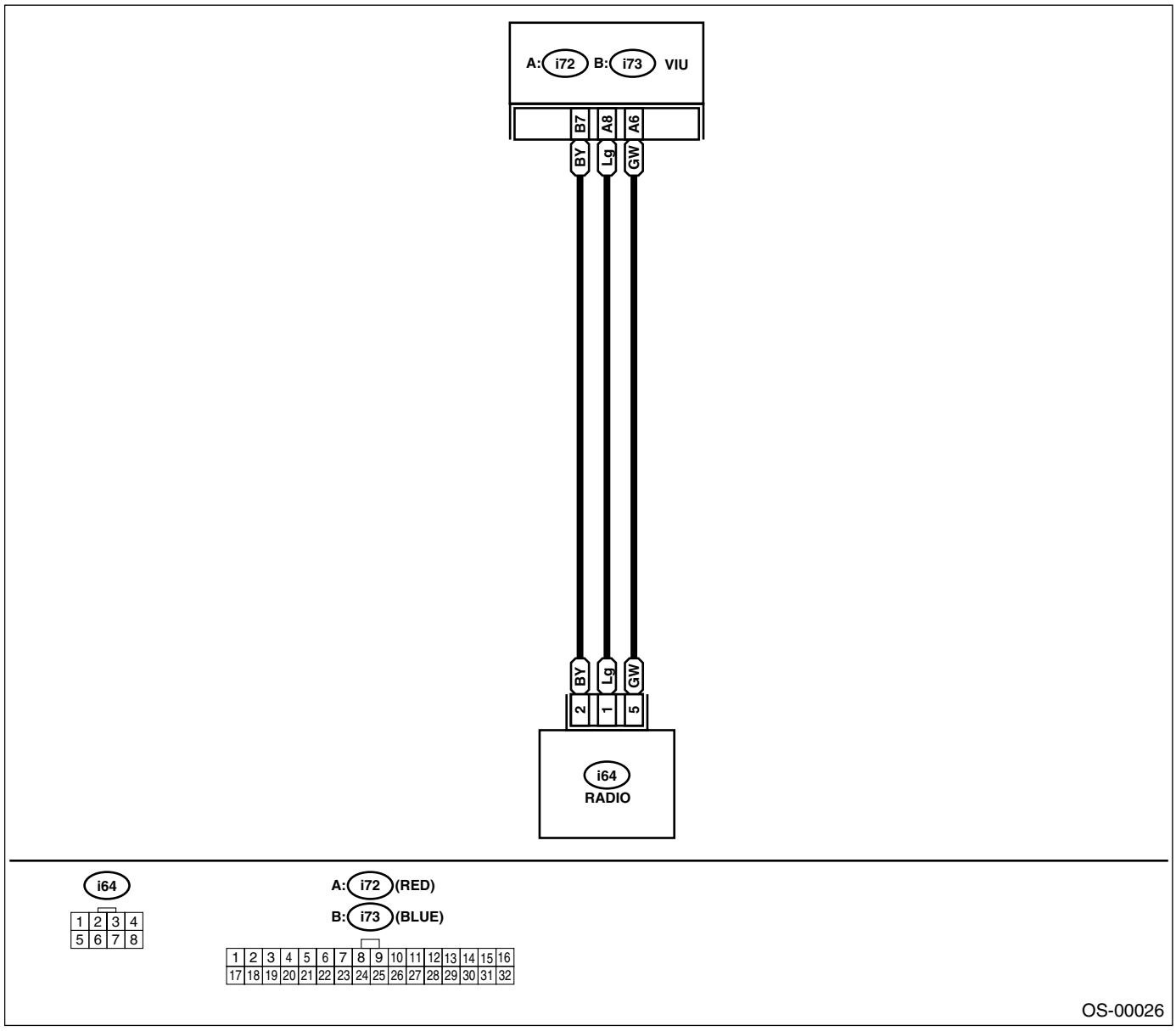
DEFINITION: OnStar (R) Operator notifies to receiver that the required setup of the OnStar (R) system is impossible.



	Step	Check	Yes	No
1	**CHECK IGNITION ON SIGNAL CIRCUIT.** 1) Turn ignition switch to OFF. 2) Disconnect connection from VCU. 3) Turn ignition switch to ON (do not let the engine run). 4) Measure voltage between ignition ON signal circuit and ground. ***Connector & Terminal*** ***(i72) No. 31 (+) — Chassis ground (–):***	Is the measured value 9 to 16 V?	Go to step **4.**	Go to step **2.**
2	**CHECK IGNITION ON SIGNAL HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect VCU connector. 4) Measure resistance between VIU connector and VCU connector. ***Connector & Terminal*** ***(i72) No. 31 — (i71) No. 12:***	Is the measured value less than 0.5 Ω?	Go to step **3.**	Repair open harness.
3	**CHECK IGNITION ON SIGNAL HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 31 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **5.**	Repair ground short of harness.
4	**CHECK VCU HARNESS CONNECTOR.** Check if there is any poor contact in VCU harness connector.	Is there any poor contact in connector?	Go to step **6.**	Repair poor contact in connector.
5	**CHECK VIU HARNESS CONNECTOR.** Check if there is any poor contact in VIU harness connector.	Is there any poor contact in connector?	Go to step **7.**	Repair poor contact in connector.
6	**CHECK VCU.** IMPORTANT Perform OnStar (R) setup procedure. Replace VCU. <Ref. to OS-5, Vehicle Communication Unit VCU.>	—	Go to step **8.**	—
7	**CHECK VIU.** IMPORTANT Perform OnStar (R) setup procedure. Replace VIU. <Ref. to OS-4, Vehicle Interface Unit VIU.>	—	Go to step **8.**	—
8	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**

E: ONSTAR (R) AUDIO DOES NOT OPERATE.

DEFINITION: Audio system display does not change into “Call”, even if all buttons are pressed.



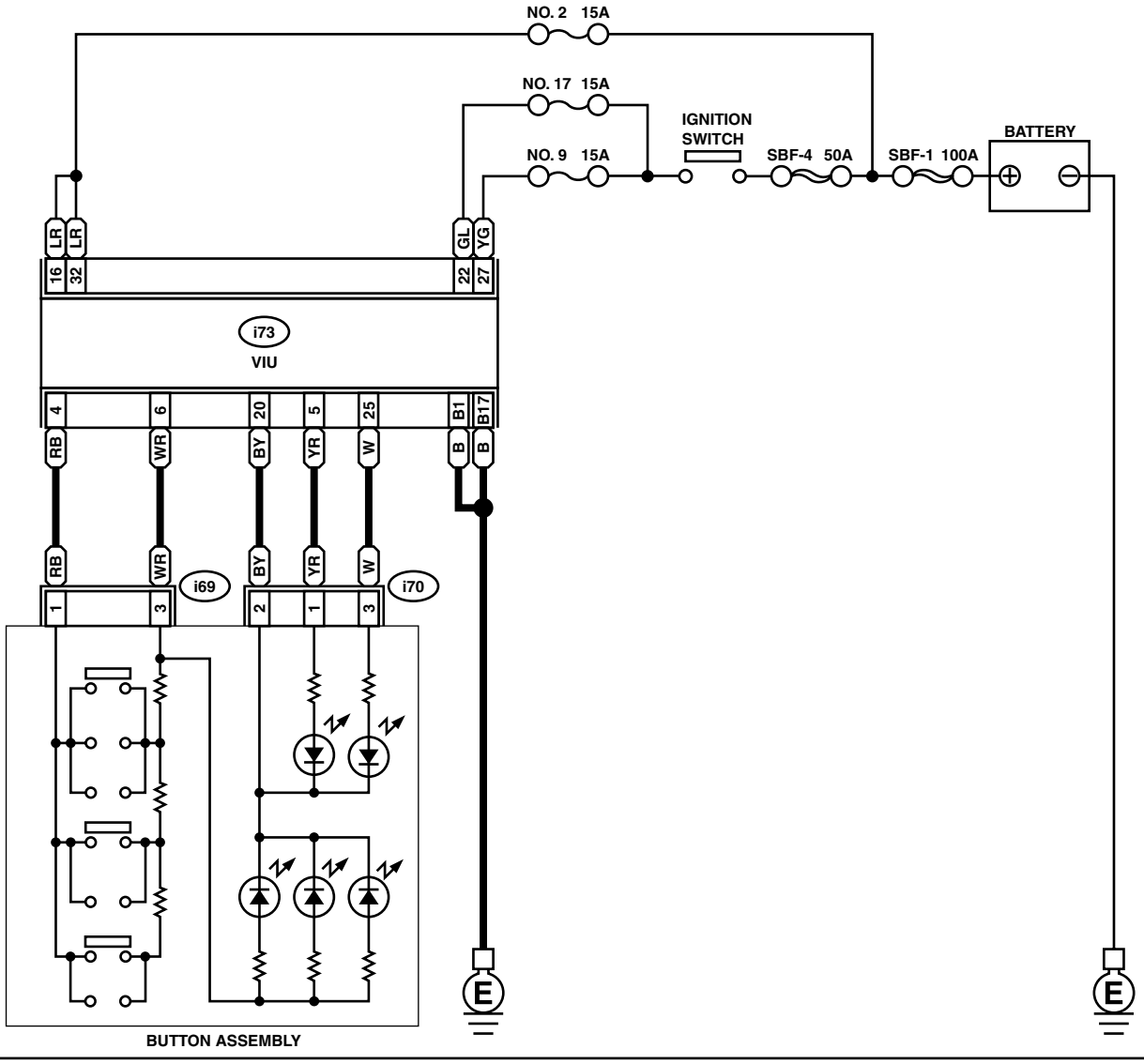
	Step	Check	Yes	No
1	**CHECK LED.** IMPORTANT Before pressing button, call OnStar (R) call center to notify the inspection. 1) Turn ignition to ON (do not let the engine run).	Does LED illuminate, when all of buttons are pressed one to another?	Go to step **2.**	Perform inspection of One or more OnStar (R) button does not operate. <Ref. to OS-34, ONE OR MORE OnStar (R) BUTTONS DO NOT OPERATE., Diagnosis for Each Symptom.>
2	**CHECK AUDIO SYSTEM** 1) Turn ignition to ON (do not let the engine run). 2) Turn radio ON. 3) Set the volume to comfortable level. 4) Activate all bottons	Does the audio system display “Call”?	Go to step **11.**	Go to step **3.**
3	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect audio connector. 4) Measure resistance between VIU connector and audio connector. ***Connector & Terminal*** ***(i72) No. 6 — (i69) No. 5:*** ***(i72) No. 8 — (i69) No. 1:*** ***(i73) No. 7 — (i69) No. 2:***	Is the measured value less than 0.5 Ω?	Go to step **4.**	Repair open harness.
4	**CHECK HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 6 — Chassis ground:*** ***(i72) No. 8 — Chassis ground:*** ***(i73) No. 7 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **5.**	Repair ground short of harness.
5	**CHECK HARNESS.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i72) No. 6 (+) — Chassis ground (–):*** ***(i72) No. 8 (+) — Chassis ground (–):*** ***(i73) No. 7 (+) — Chassis ground (–):***	Is the measurede value less than 1 V?	Go to step **6.**	Repair battery short of harness.
6	**CHECK VIU HARNESS CONNECTOR.** Check if there is any poor contact in VIU harness connector.	Is there any poor contact in connector?	Go to step **7.**	Repair connector.
7	**CHECK VIU.** IMPORTANT Perform OnStar (R) setup procedure. Replace vehicle interface unit (VIU). <Ref. to OS-4, Vehicle Interface Unit VIU.>	—	Go to step **8.**	—
8	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **8.**
9	**CHECK AUDIO HARNESS CONNECTOR.** Check if there is any poor contact in audio harness connector.	Is there any poor contact in connector?	Go to step **9.**	Repair connector.
10	**CHECK AUDIO.** Replace audio. <Ref. to ET-3, Radio System.>	—	Go to step **11.**	—

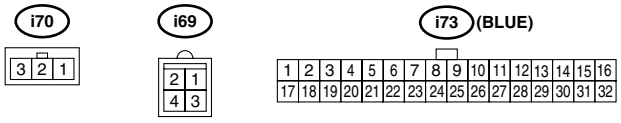
Step		Check	Yes	No
11	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**

MEMO:

F: ONSTAR (R) LED DOES NOT OPERATE.

DEFINITION: When ignition switch is turned to ON, OnStar (R) green LED does not illuminate.





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	Step	Check	Yes	No
1	**CHECK LED SIGNAL.** 1) Turn ignition switch to OFF. 2) Disconnect connection from button assembly connector. 3) Turn ignition switch to ON (do not let the engine run). 4) Measure voltage of key pad green LED signal circuit. ***Connector & Terminal*** ***(i73) No. 5 (+) — Chassis ground:*** ***(i73) No. 25 (+) — Chassis ground (–):***	Is the measured value within 7 to 9 V?	Go to step **10.**	Go to step **2.**
2	**CHECK HARNESS.** 1) Turn ignition switch to OFF. 2) Disconnect VIU connector. 3) Disconnect button assembly connector. 4) Measure resistance between VIU connector and button assembly connector. ***Connector & Terminal*** ***(i73) No. 5 — (i70) No. 1:*** ***(i73) No. 20 — (i70) No. 2:*** ***(i73) No. 25 — (i70) No. 3:***	Is the measured value less than 0.5 Ω?	Go to step **2.**	Repair open harness.
3	**CHECK HARNESS.** Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 5 — Chassis ground:*** ***(i73) No. 20 — Chassis ground:*** ***(i73) No. 25 — Chassis ground:***	Is the measured value more than 1 MΩ?	Go to step **4.**	Repair ground short of harness.
4	**CHECK LED SIGNAL HARNESS.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 5 (+) — Chassis ground (–):*** ***(i73) No. 25 (+) — Chassis ground (–):***	Is the measurede value less than 1 V	Go to step **5.**	Repair battery short of harness. Replace button assembly. <Ref. to OS-6, Button Assembly.>
5	**CHECK VIU POWER SUPPLY.** 1) Turn the ignition switch to ON. 2) Measure voltage between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 16 (+) — Chassis ground (–):*** ***(i73) No. 32 (+) — Chassis ground (–):*** ***(i73) No. 22 (+) — Chassis ground (–)*** ***(i73) No. 27 (+) — Chassis ground (–):***	Is the measured value more than 9 V?	Go to step **6.**	Check fuse or repair open circuit in harness.
6	**CHECK VIU GROUND.** 1) Turn ignition switch to OFF. 2) Measure resistance between VIU connector and chassis ground. ***Connector & Terminal*** ***(i73) No. 1 — Chassis ground:*** ***(i73) No. 7 — Chassis ground:***	Is the measured value less than 0.5 Ω?	Go to step **7.**	Repair open circuit in harness.
7	**CHECK BUTTON ASSEMBLY HARNESS CONNECTOR.** Check if there is any poor contact in button assembly connector.	Is there any poor contact in connector?	Go to step **8.**	Repair poor contact in connector.
8	**CHECK BUTTON ASSEMBLY.** Replace button assembly. <Ref. to OS-6, Button Assembly.>	Is repair work completed?	Go to step **9.**	—

Step		Check	Yes	No
9	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **8.**
10	**CHECK VIU HARNESS CONNECTOR.** Check if there is any poor contact in VIU harness connector.	Is there any poor contact in connector?	Go to step **11.**	Repair poor contact in connector.
11	**CHECK VCU.** IMPORTANT Perform setup procedure of OnStar (R). Replace vehicle interface unit (VIU). <Ref. to OS-4, Vehicle Interface Unit VIU.>	—	Go to step **12.**	—
12	**CHECK SYSTEM.** Run the system and confirm the result of repair.	Was the trouble repaired?	System is OK.	Go to step **1.**