DI838-03

DTC	P3125	Converter & Inverter Assembly Malfunction

CIRCUIT DESCRIPTION

If driving the vehicle with the DCDC converter malfunctioning, the voltage of the auxiliary battery will drop, which will make it impossible to keep driving the vehicle. Therefore, HV ECU checks the operation of the DCDC converter and gives warning to the driver if malfunction is detected.

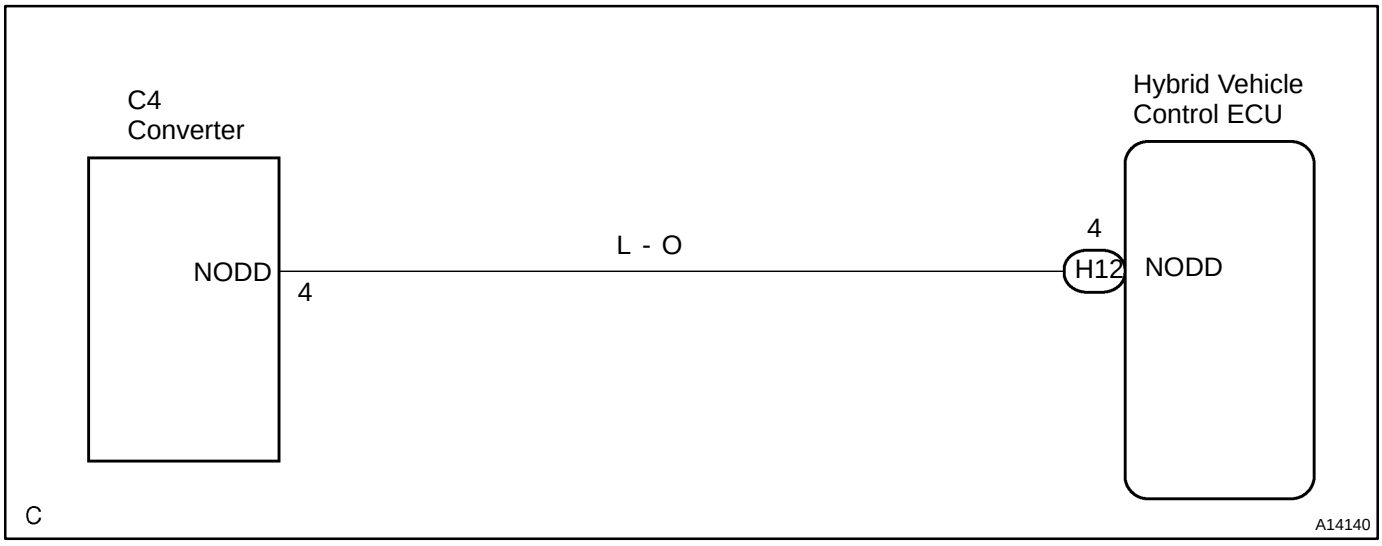
HINT:

- When using an OBD scan tool other than TOYOTA hand-held tester, check all the steps.
- When using TOYOTA hand-held tester, confirm the information code and check it.

DTC P3125 - Information code 263, 264, 265

INF. Code.	Detecting Condition	Trouble Area
263	+B short in DCDC converter NODD wiring	• Converter & inverter assembly • Wire harness
264	DCDC converter malfunction	
265	Open or GND short in DCDC converter NODD wiring	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU NODD terminal and converter & inverter NODD terminal (See page IN-41).**

HINT:
The converter has +B short if the battery voltage is always applied to the HV ECU NODD terminal with the ignition ON.

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

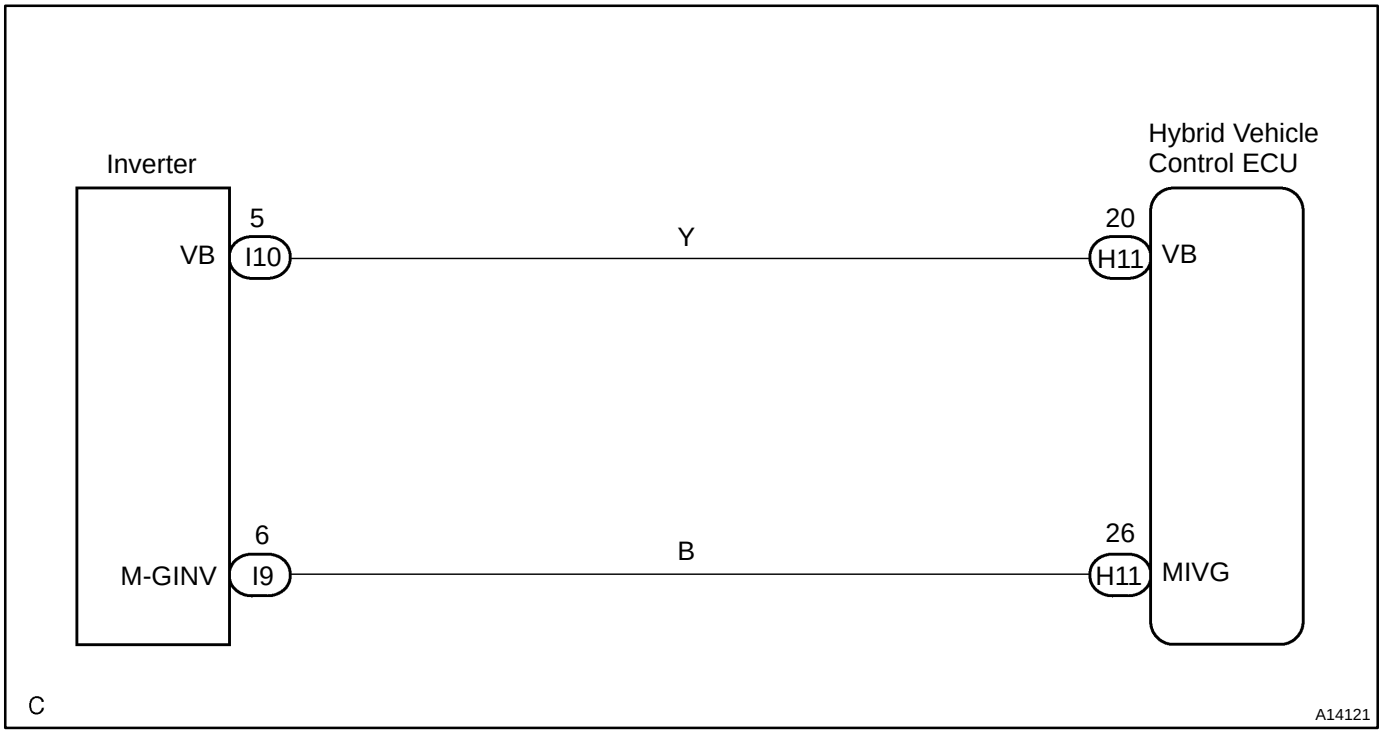
CIRCUIT DESCRIPTION

The HV ECU checks the inverter voltage and detects malfunction.

DTC P3125 - Information code 266, 267, 268, 269, 270

INF. Code.	Detecting Condition	Trouble Area
266	Open or GND short in inverter voltage signal circuit	• Converter & inverter assembly • Wire harness
267	+B short in inverter voltage signal circuit	
268	Inverter voltage signal is inconsistent with battery voltage	
269	Inverter voltage sensor malfunction	
270	Abnormality of line connection of inverter voltage signal circuit (when there is a history that the state of malfunction continued during inverter fail safe mode)	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU VB and MIVG terminals and converter & inverter assembly VB and M-GINV terminal (See page IN-41).**

HINT:
Confirm that there is no open circuit in the wire harness. If the voltage between the HV ECU VB or MIVG terminal and body ground is always more than 5V with the ignition ON, the inverter voltage signal circuit has +B short.

NG → **Repair or replace wire harness.**

OK

2	**Is there DTC P3100 being output?**

YES → **Check applicable DTC.**

NO

Replace converter & inverter assembly.

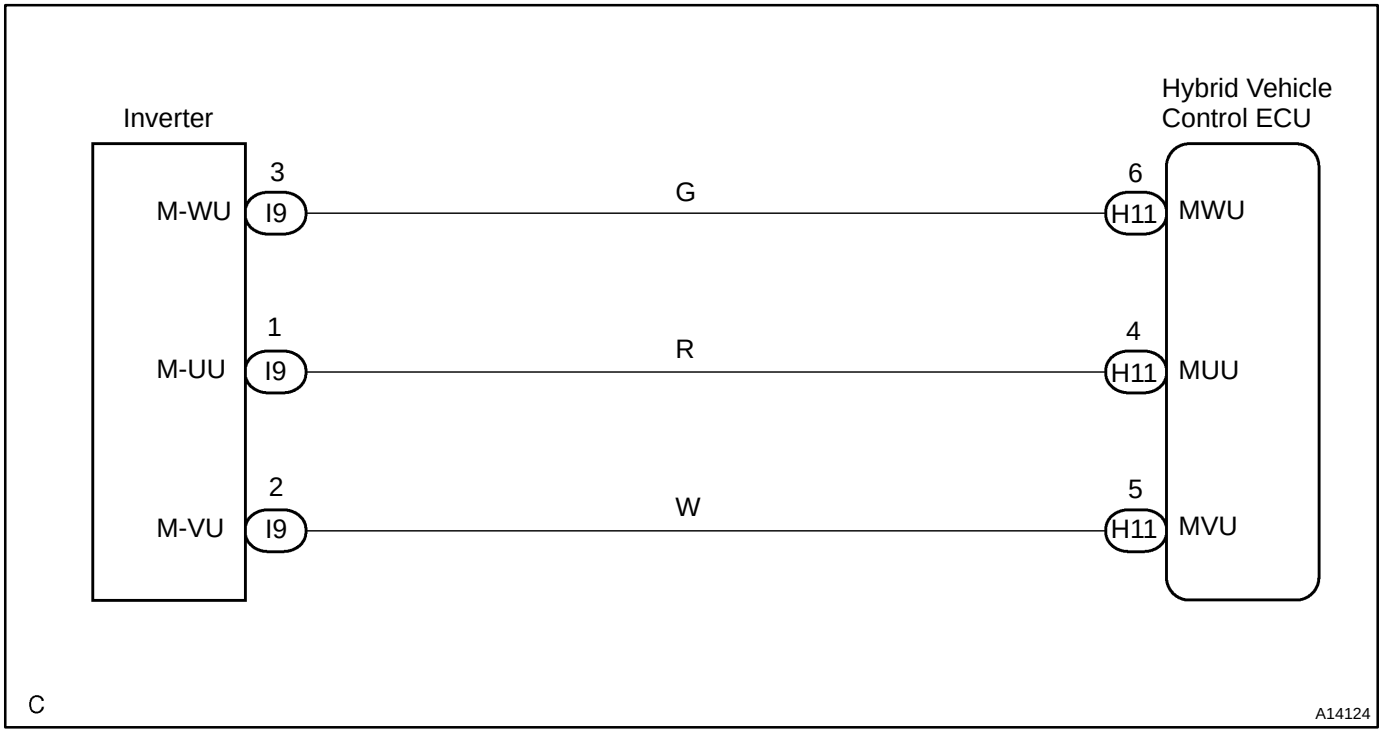
CIRCUIT DESCRIPTION

The HV ECU detects faulty line connection inside the inverter.

DTC P3125 - Information code 272

INF. Code.	Detecting Condition	Trouble Area
272	Abnormality of line connection of motor PWM (when there is a history that the state of malfunction continued during inverter fail safe mode)	• Wire harness • Converter & inverter assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check open and short in wire harness between HV ECU terminals (MUU, MVU, MWU) and inverter terminals.

NG → Repair or replace wire harness.

OK

2	Is there DTC P3100 being output?

YES → Check applicable DTC.

NO

Replace converter & inverter assembly.

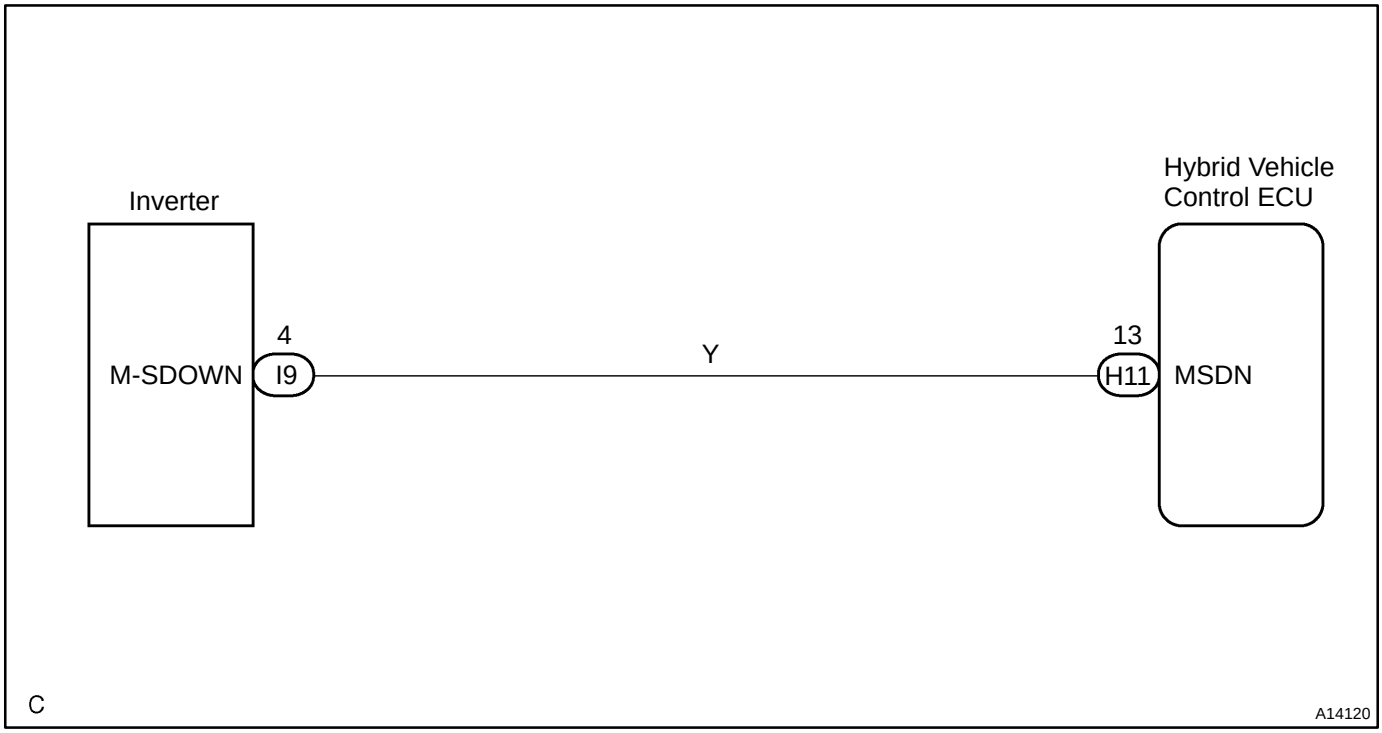
CIRCUIT DESCRIPTION

The HV ECU detects faulty line connection inside the inverter.

DTC P3125 - Information code 273

INF. Code.	Detecting Condition	Trouble Area
273	Motor inverter malfunction	• Converter & inverter assembly • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open and short in wire harness between HV ECU MSDN terminal and converter & inverter M-SDOWN terminal.**

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

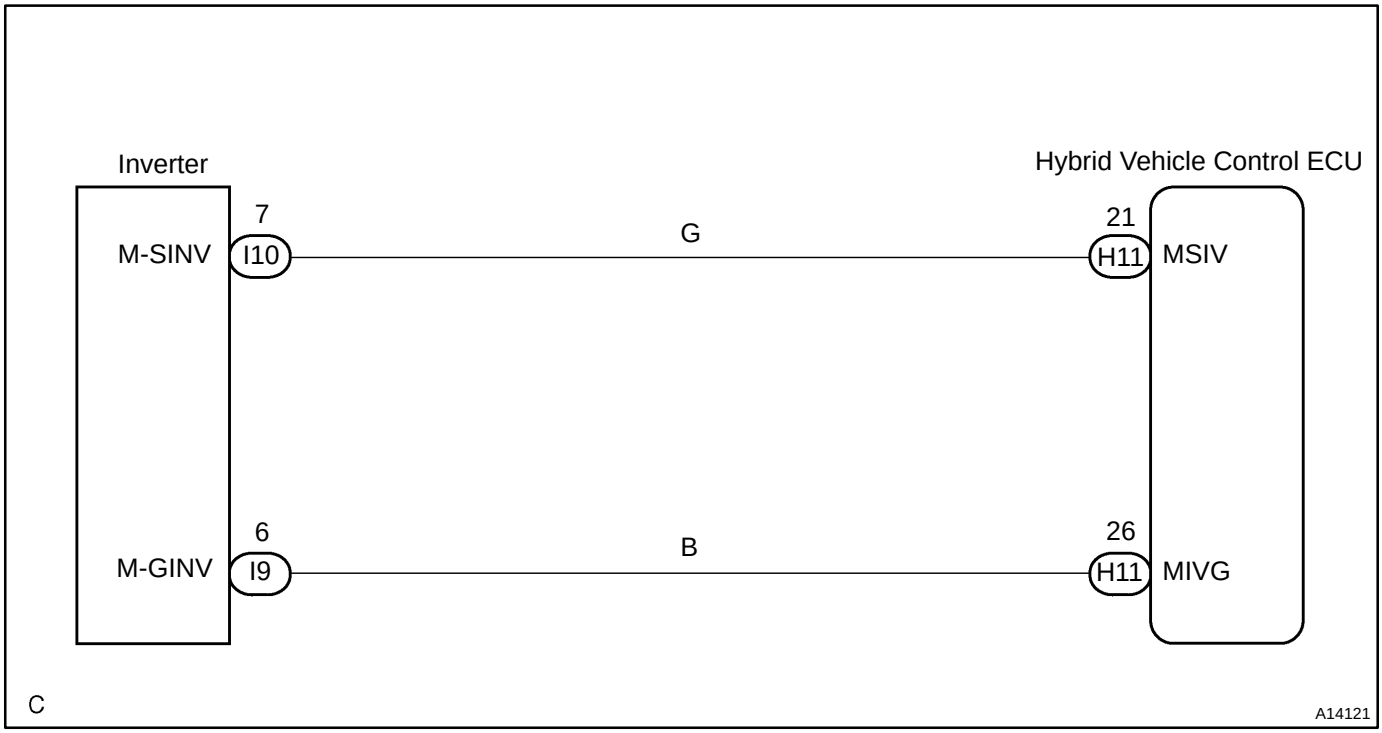
CIRCUIT DESCRIPTION

The HV ECU checks the inverter temperature and controls the load limitation in order to prevent the inverter from overheating. Also, it detects the abnormality of the line connection of the inverter temperature sensor and the malfunction of the sensor itself.

DTC P3125 - Information code 274, 275, 276, 277

INF. Code.	Detecting Condition	Trouble Area
274	Open or +B short in motor inverter temperature sensor	• Converter & inverter assembly • Wire harness
275	GND short in motor inverter temperature sensor	
276	Motor inverter temperature sensor malfunction	
277	Motor inverter temperature sensor performance problem	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU MIT and MIVG terminals and converter & inverter M-INVT, M-GINV terminals (See page IN-41).**

HINT:
Confirm that there is no open circuit in the wire harness. If the voltage between the HV ECU MIT or MIVG terminal and body ground is always more than 5V with the ignition ON, the motor inverter temperature sensor circuit has +B short.

NG → **Repair or replace wire harness.**

OK

Check for open in motor inverter temperature sensor and then replace converter & inverter assembly. Check motor inverter temperature sensor (See page HV-14).

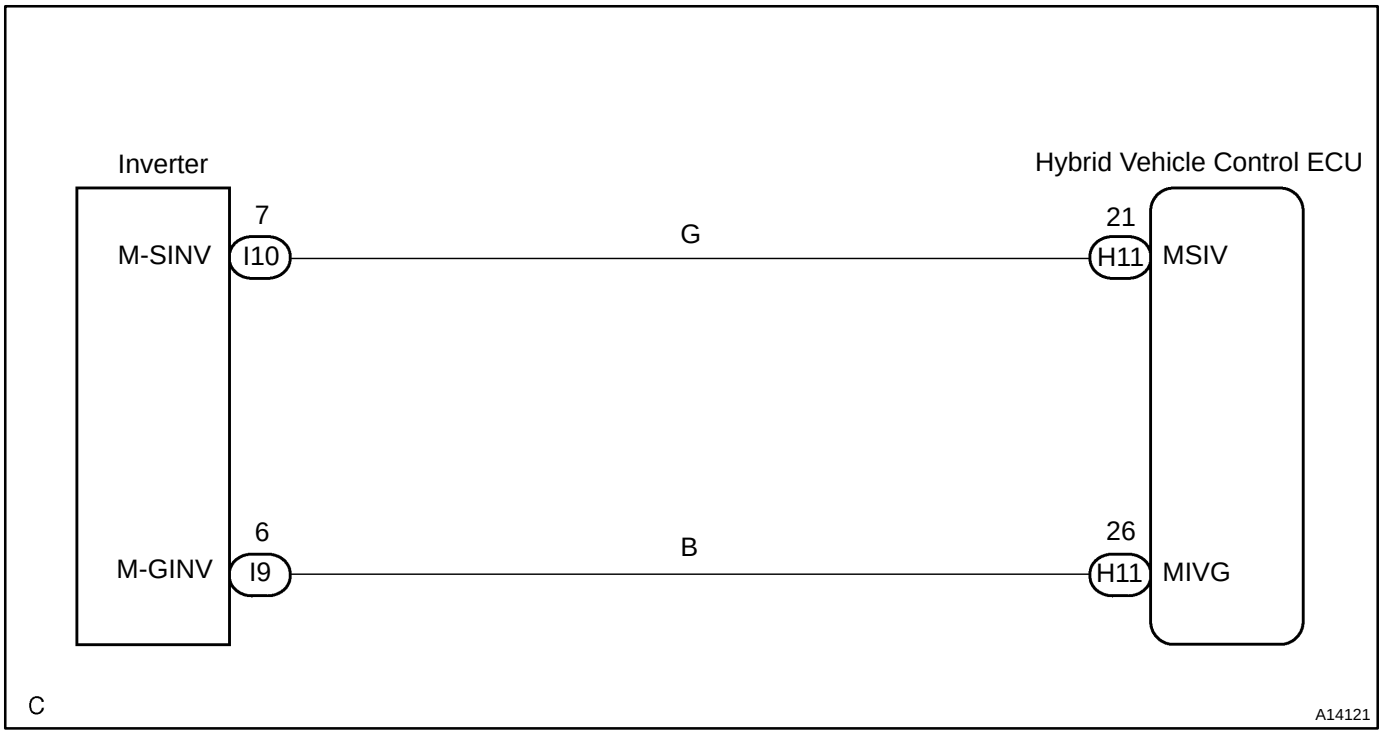
CIRCUIT DESCRIPTION

The HV ECU checks the line connection of the motor inverter stop signal circuit and enters the fail safe mode (limited output driving) if malfunction is detected.

DTC P3125 - Information code 278, 280

INF. Code.	Detecting Condition	Trouble Area
278	+B short in motor inverter stop signal circuit	• Converter & inverter assembly • Wire harness
280	Open or GND short in motor inverter stop signal circuit	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU MSIV and MIVG terminals and converter & inverter assembly M-SINV and M-GIVN terminals (See page IN-41).**

HINT:

The motor inverter stop signal circuit has +B short if the voltage between the HV ECU MSIV or MIGV terminal and body ground is always more than 13 V with the ignition ON (”READY” light OFF).

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

CIRCUIT DESCRIPTION

DTC P3125 - Information code 279, 281, 282

INF. Code.	Detecting Condition	Trouble Area
279	Over voltage of inverter	• Converter & inverter assembly
281	Voltage drop of inverter power source	
282	Inverter circuit broken	

INSPECTION PROCEDURE

If the information code 279 or 281 is output, check if other DTC or information codes are recorded. If they are recorded, check and repair those codes first.
If the information code 279 or 281 alone is recorded, replace the converter & inverter assembly.
If the information code 282 is output, replace the converter & inverter assembly.

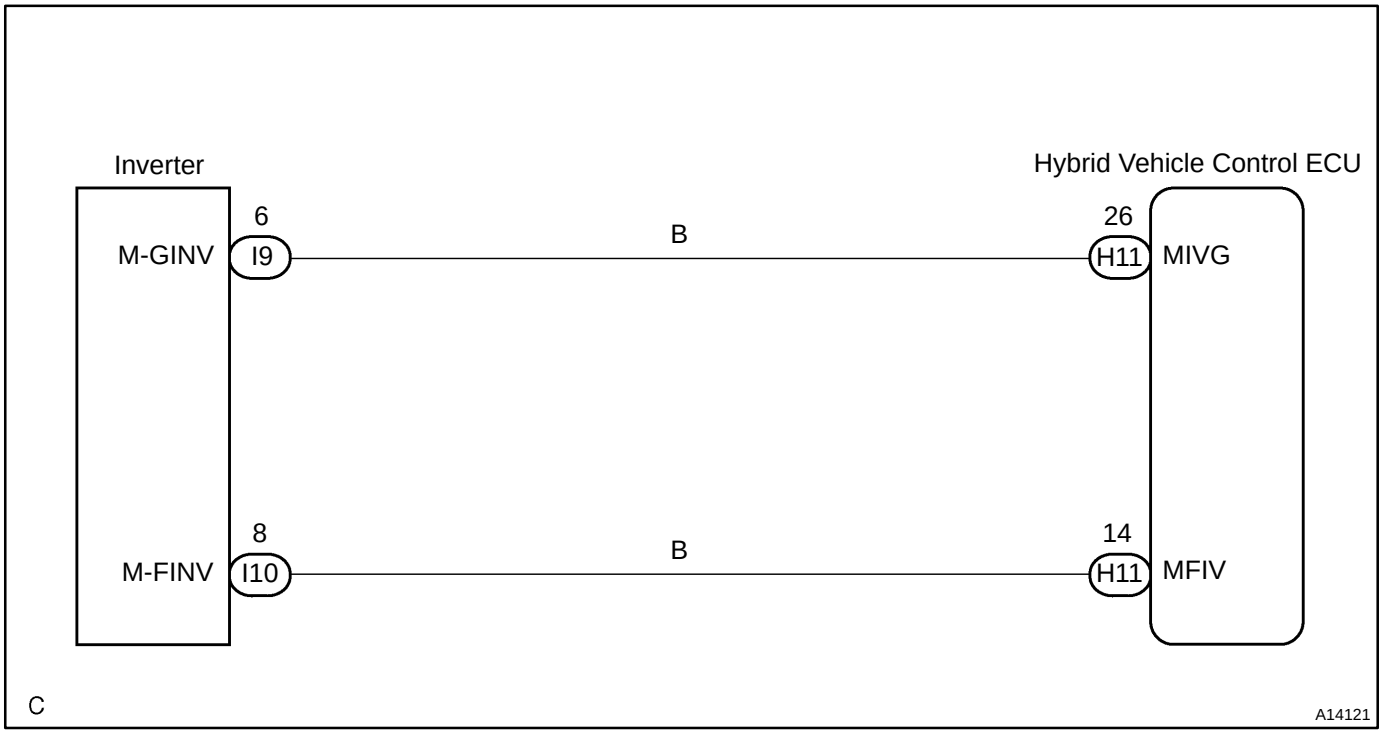
CIRCUIT DESCRIPTION

The HV ECU checks the line connection of the motor inverter fail signal circuit and detects malfunction.

DTC P3125 - Information code 283, 285

INF. Code.	Detecting Condition	Trouble Area
283	+B short in motor inverter fail signal circuit	• Converter & inverter assembly • Wire harness
285	Open or GND short in motor inverter fail signal circuit	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU MFIV and MIVG terminals and converter & inverter assembly M-FINV and M-GINV terminals (See page IN-41).**

HINT:

The motor inverter fail signal circuit has +B short if the voltage between the HV ECU MIVG or MFIV terminal and body ground is always more than 13 V with the ignition ON (”READY” light OFF).

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

CIRCUIT DESCRIPTION

DTC P3125 - Information code 284, 286, 287

INF. Code.	Detecting Condition	Trouble Area
284	Inverter overheating	• Converter & inverter assembly
286	Inverter circuit broken	
287	Inverter internal short	

INSPECTION PROCEDURE

If the information code 284 or 287 is output, check if other DTC or information codes are recorded. If they are recorded, check and repair those codes first.
If the information code 284 or 287 alone is recorded, replace the converter & inverter assembly.
If the information code 286 is output, replace the converter & inverter assembly.

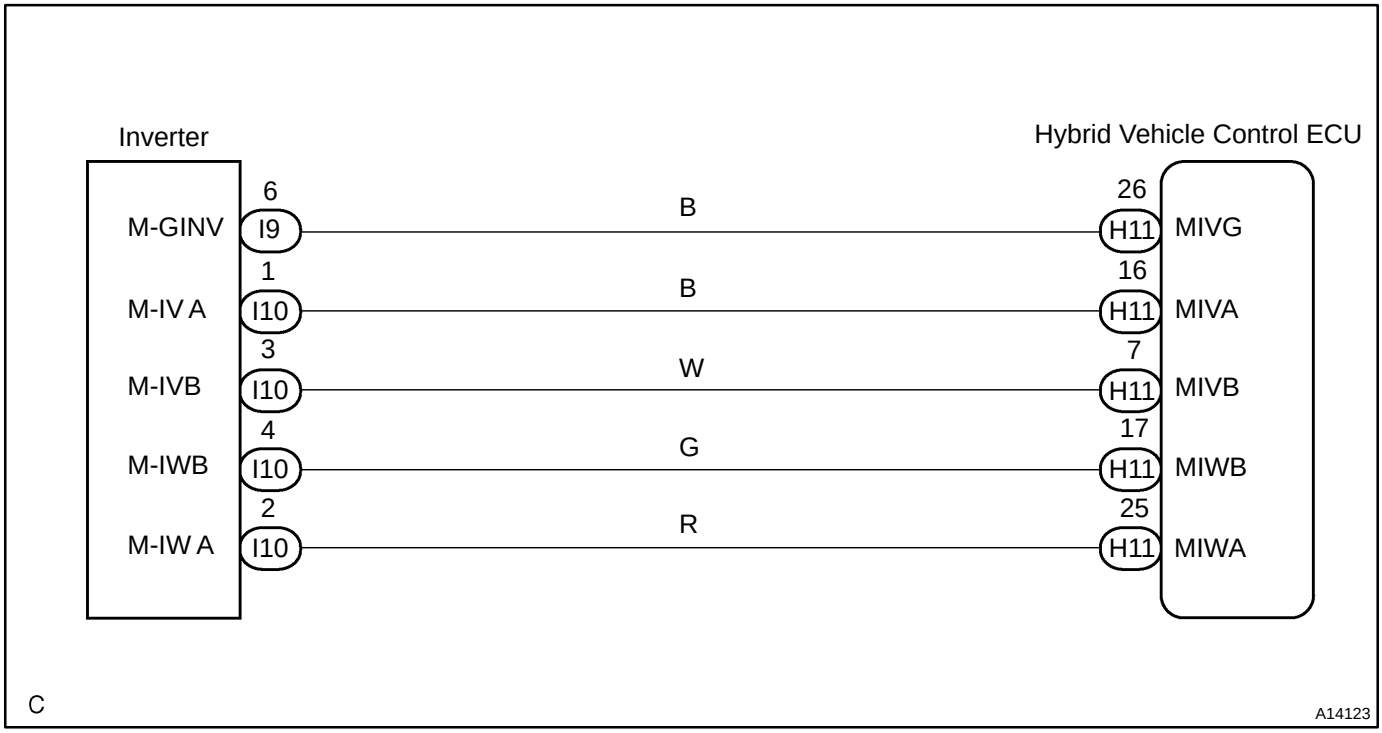
CIRCUIT DESCRIPTION

The HV ECU detects the malfunction of the motor inverter current sensor. It detects the malfunction of the sensor system, not of the high voltage system.

DTC P3125 - Information code 288, 289, 290, 292, 294, 296, 297, 298, 300, 302,

INF. Code.	Detecting Condition	Trouble Area
289	Open in motor inverter current sensor (V phase sub sensor)	• Converter & inverter assembly • Wire harness
292	Open in motor inverter current sensor (V phase main sensor)	
297	Open in motor inverter current sensor (W phase sub sensor)	
300	Open in motor inverter current sensor (W phase main sensor)	
288	Motor inverter current sensor malfunction (V phase sub sensor)	
290	Motor inverter current sensor malfunction (V phase main sensor)	
294	Motor inverter current sensor V phase performance problem	
296	Motor inverter current sensor malfunction (W phase sub sensor)	
298	Motor inverter current sensor malfunction (W phase main sensor)	
302	Motor inverter current sensor W phase performance problem	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check continuity of wire harness between HV ECU and converter & inverter assembly (See page IN-41).**

OK:

Continuity: Less then 1 Ω

HV ECU Terminals	Inverter Terminals
MIVA	M-IVA
MIVB	M-IVB
MIWA	M-IWA
MIWB	M-IWB
MIVG	M-GINV

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

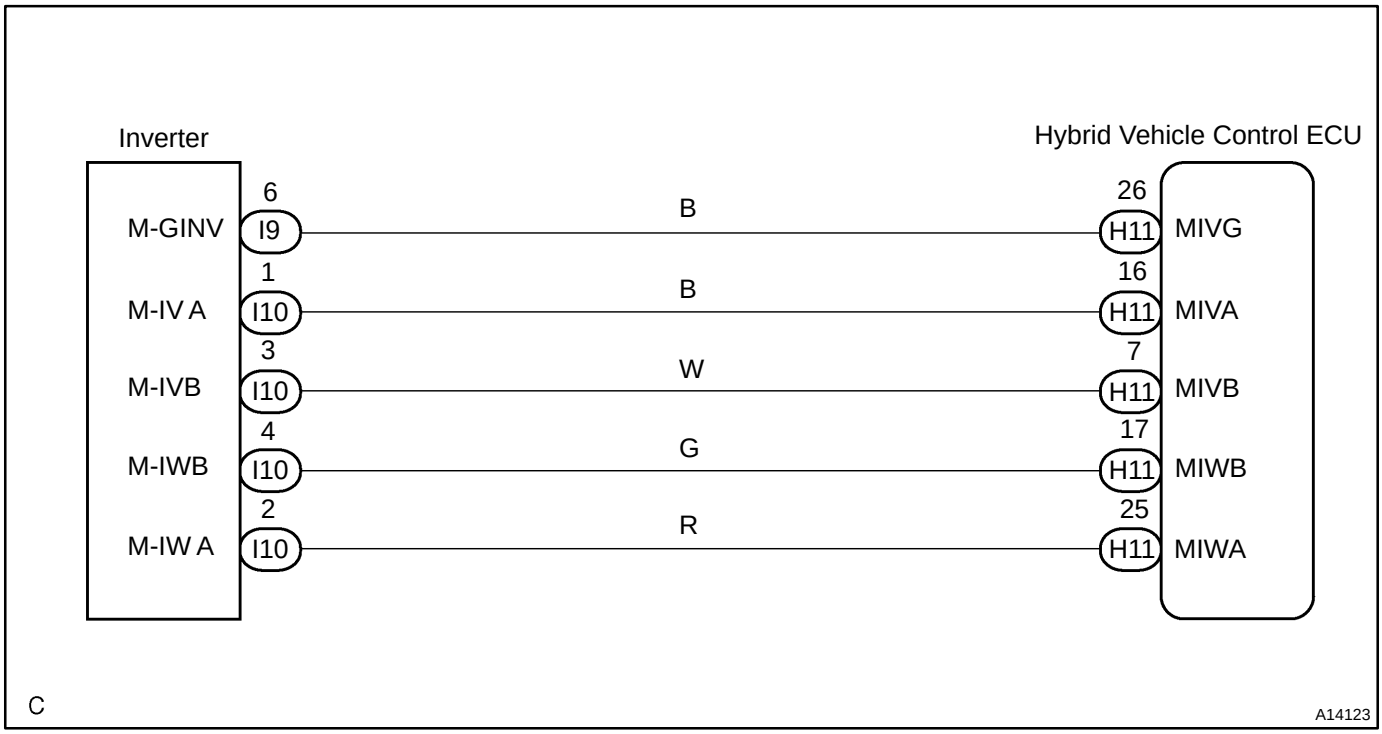
CIRCUIT DESCRIPTION

The HV ECU detects the malfunction of the motor inverter current sensor. It detects the malfunction of the sensor system, not of the high voltage system.

DTC P3125 - Information code 291, 293, 295, 299, 301, 303

INF. Code.	Detecting Condition	Trouble Area
291	When there is a history that the state of malfunction continued during inverter fail safe mode.	• Converter & inverter assembly • Wire harness
293		
295		
299		
301		
303		

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check continuity of wire harness between HV ECU and converter & inverter assembly (See page IN-41).**

OK:

Continuity: Less then 1 Ω

HV ECU Terminals	Inverter Terminals
MIVA	M-IVA
MIVB	M-IVB
MIWA	M-IWA
MIWB	M-IWB
MIVG	M-GINV

NG → **Repair or replace wire harness.**

OK

2	**Is there DTC P3100 being output?**

YES → **Check applicable DTC.**

NO

Replace converter & inverter assembly.

CIRCUIT DESCRIPTION

The HV ECU detects the malfunction of the motor inverter current sensor. It detects the malfunction of the sensor system, not of the high voltage system.

DTC P3125 - Information code 306, 307

INF. Code.	Detecting Condition	Trouble Area
306	Failure in monitoring motor torque performance	• Converter & inverter assembly
307	Abnormal current value of motor	

INSPECTION PROCEDURE

If the information code 306 or 307 is output, check if other DTC or information codes are recorded. If they are recorded, check and repair those codes first.

If the information code 306 or 307 alone is recorded, replace the converter & inverter assembly.

CIRCUIT DESCRIPTION

If the HV ECU detects the collision signal from the airbag or inverter, the HV ECU recognizes it as the destruction of the vehicle and then shuts down the high voltage system to ensure safety.

DTC P3125 - Information code 308

INF. Code.	Detecting Condition	Trouble Area
308	Input of collision signal from airbag or inverter	-

HINT:

When the vehicle collision occurs and the airbag is deployed, this information code will be recorded and the high voltage system will be shut down.

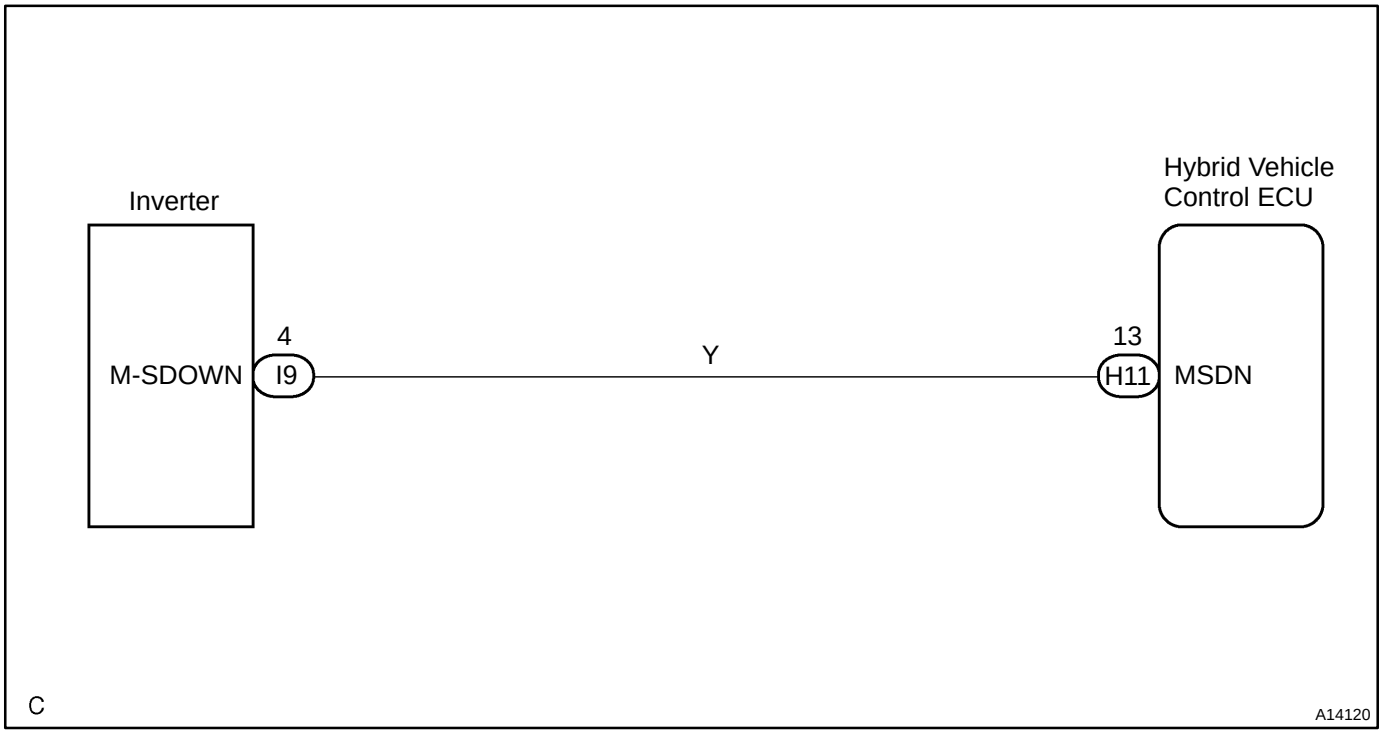
CIRCUIT DESCRIPTION

The HV ECU checks the line connection of the motor gate shutdown signal circuit and detects malfunction.

DTC P3125 - Information code 304, 305

INF. Code.	Detecting Condition	Trouble Area
304	+B short in motor gate shutdown signal circuit	• Converter & inverter assembly • Wire harness
305	Open or GND short in motor gate shutdown signal circuit	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU MSDN terminal and converter & inverter assembly M-SDOWN terminals (See page IN-41).**

HINT:
Confirm that there is no open circuit in the wire harness. The motor gate shutdown signal circuit has +B short if the battery voltage is always applied to the HV ECU MSDN terminal with the ignition ON.

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

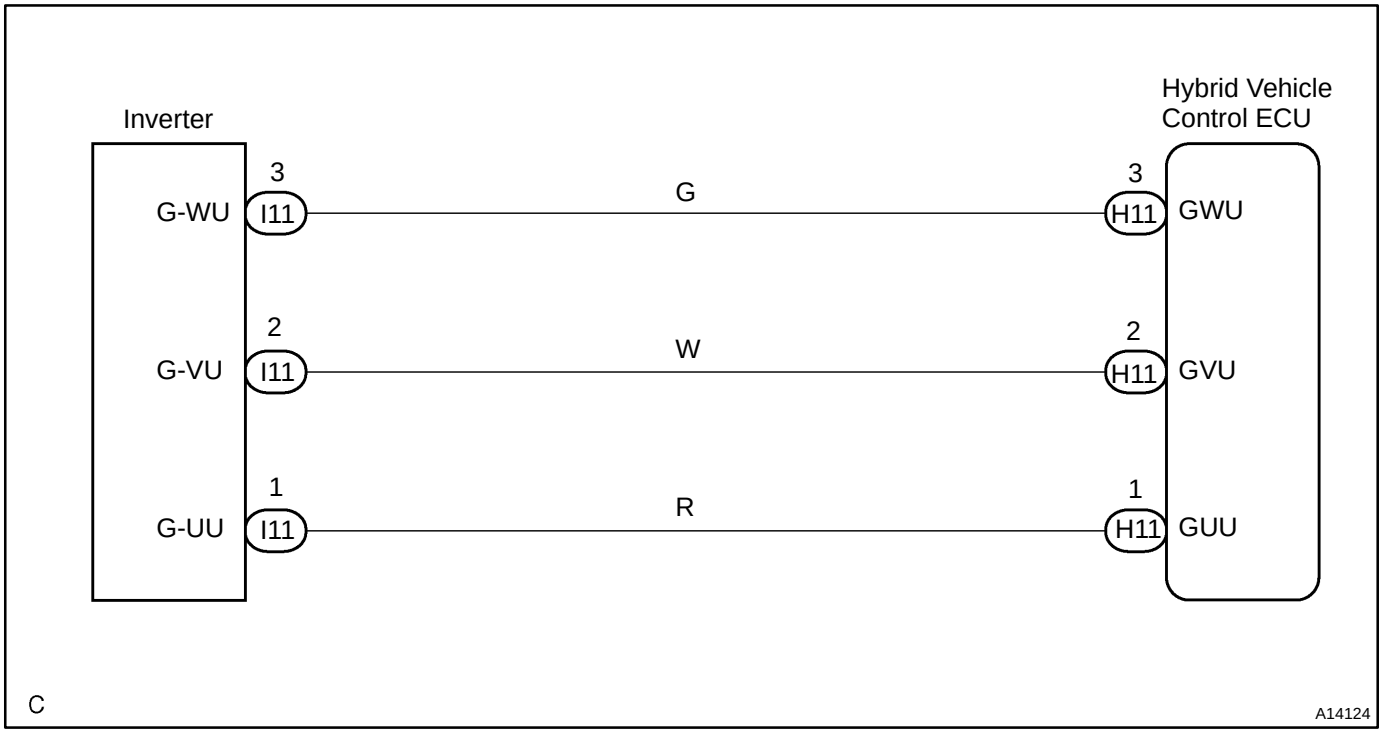
CIRCUIT DESCRIPTION

The HV ECU detects faulty line connection inside the inverter.

DTC P3125 - Information code 309

INF. Code.	Detecting Condition	Trouble Area
309	Open or short in generator inverter switching wiring (GUU, GVU, GWU)	• Wire harness • Converter & inverter assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check for open and short in wire harness between HV ECU terminals (GUU, GVU, GWU) and inverter terminals.

NG → Repair or replace wire harness.

OK ↓

2	Is there DTC P3100 being output?

YES → Check applicable DTC.

NO ↓

Replace converter & inverter assembly.

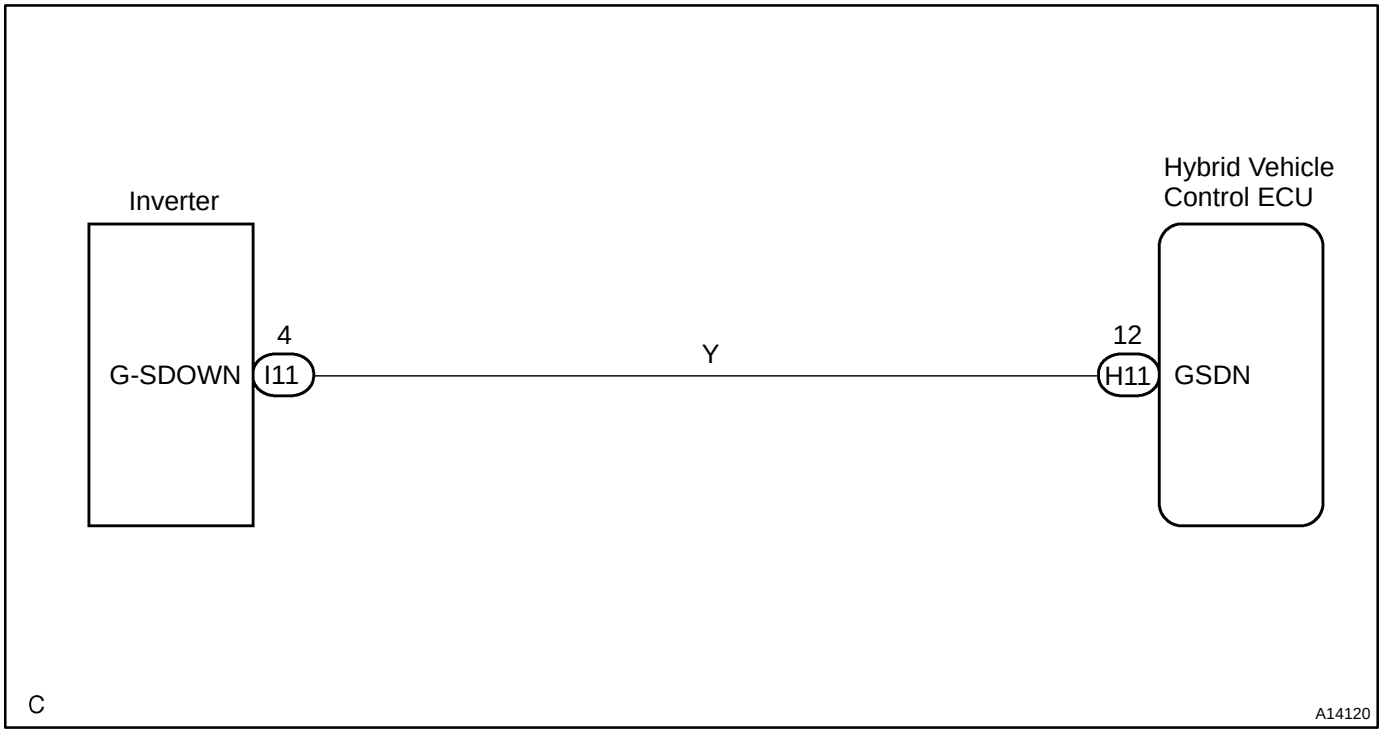
CIRCUIT DESCRIPTION

The HV ECU detects faulty line connection inside the inverter.

DTC P3125 - Information code 311

INF. Code.	Detecting Condition	Trouble Area
311	Generator inverter malfunction	• Converter & inverter assembly • Wire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open and short in wire harness between HV ECU GSDN terminal and converter & inverter S-DOWN terminal.**

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

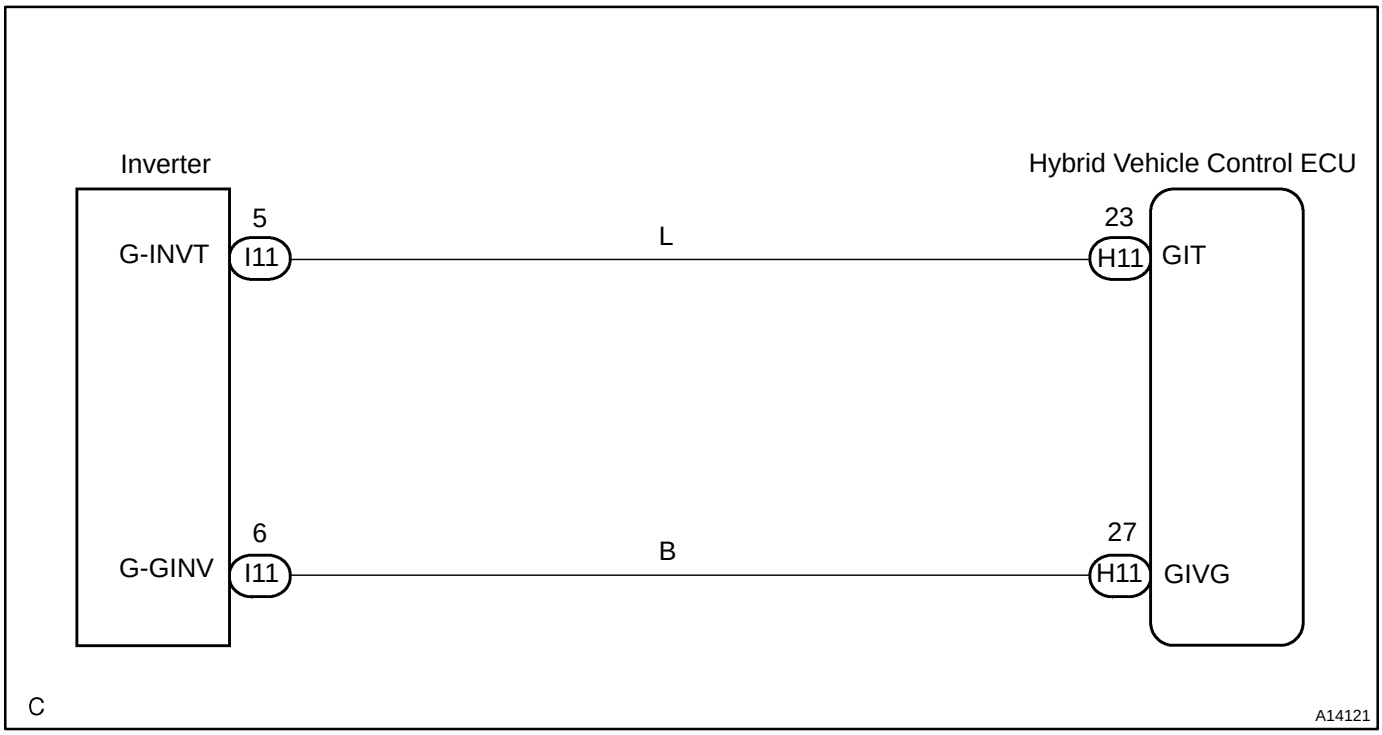
CIRCUIT DESCRIPTION

The HV ECU checks the generator temperature and controls the load limitation in order to prevent the generator from overheating. Also, it detects the abnormality of the line connection of the generator temperature sensor and the malfunction of the sensor itself.

DTC P3125 - Information code 312, 313, 314, 315

INF. Code.	Detecting Condition	Trouble Area
312	Open or +B short in generator inverter temperature sensor	• Converter & inverter assembly • Wire harness
313	GND short in generator inverter temperature sensor	
314	Generator inverter temperature sensor malfunction	
315	Generator inverter temperature sensor performance problem	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU GIT and GIVG terminals and converter & inverter G-GINV or G-GINV terminals (See page IN-41).**

HINT:
Confirm that there is no open circuit in the wire harness. The generator inverter temperature sensor circuit has +B short if the voltage between the HV ECU GIT or GIVG terminal and body ground is always more than 5V with the ignition ON.

NG → **Repair or replace wire harness.**

OK

Check for open in generator inverter temperature sensor and then replace converter & inverter assembly. Check generator inverter temperature sensor (See page HV-14).

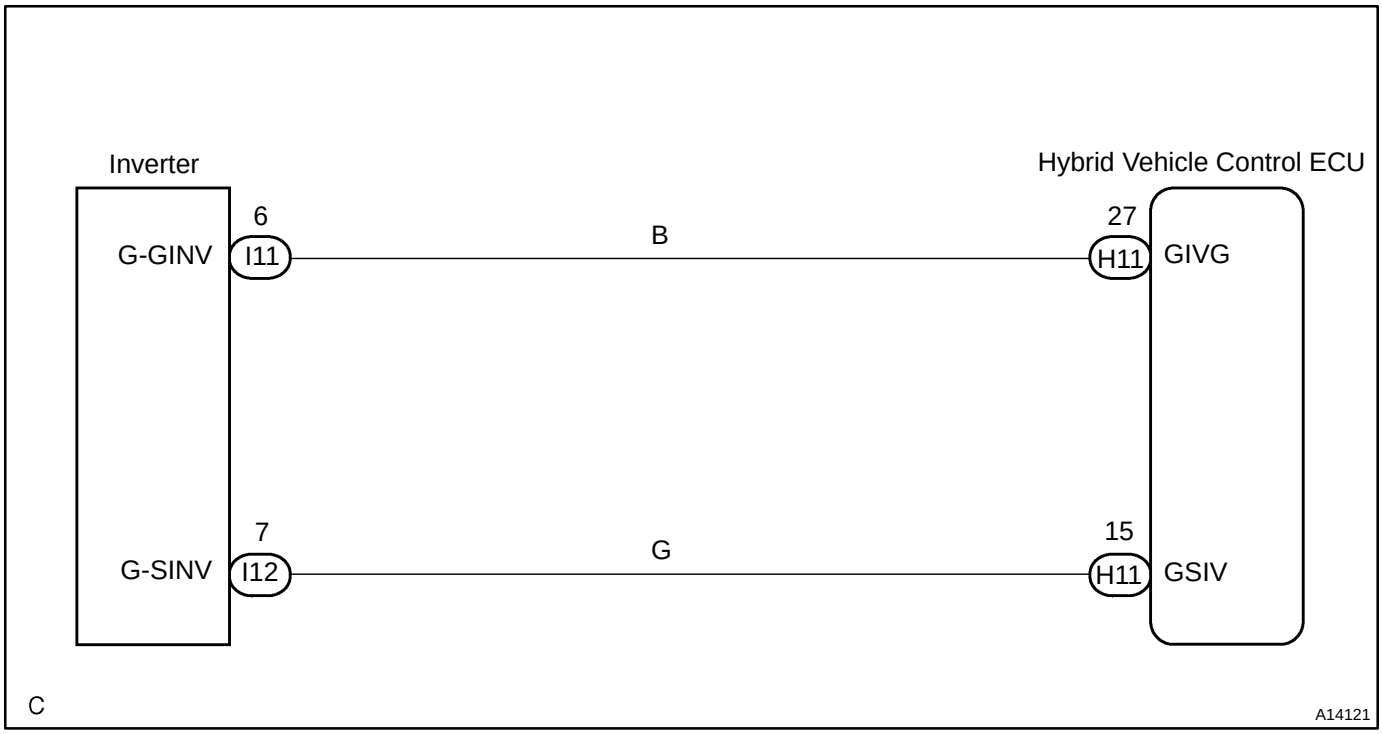
CIRCUIT DESCRIPTION

The HV ECU checks the line connection of the generator inverter stop signal circuit and enters the fail safe mode (limited driving) if malfunction is detected.

DTC P3125 - Information code 316, 318

INF. Code.	Detecting Condition	Trouble Area
316	+B short in generator inverter stop signal circuit	• Converter & inverter assembly • Wire harness
318	Open or GND short in generator inverter stop signal circuit	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU GSIV and GIVG terminals and converter & inverter assembly G-SINV and G-GINV terminals (See page IN-41).**

HINT:
The generator inverter stop signal circuit has +B short if the voltage between the HV ECU GSIV or GIVG terminal and body ground is always more than 13 V with the ignition ON (”READY” light OFF).

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

CIRCUIT DESCRIPTION

DTC P3125 - Information code 317, 319, 320

INF. Code.	Detecting Condition	Trouble Area
317	Over voltage of inverter	• Converter & inverter assembly
319	Voltage drop of inverter power source	
320	Inverter circuit broken	

INSPECTION PROCEDURE

If the information code 317 or 319 is output, check if other information codes are recorded. If they are recorded, check and repair those codes first.
If the information code 317 or 319 alone is recorded, replace the converter & inverter assembly.
If the information code 320 is output, replace the converter & inverter assembly.

CIRCUIT DESCRIPTION

The HV ECU checks the line connection of the generator inverter fail signal circuit and detects malfunction.

DTC P3125 - Information code 321, 323

INF. Code.	Detecting Condition	Trouble Area
321	+B short in generator inverter fail signal circuit	• Converter & inverter assembly • Wire harness
323	Open or GND short in generator inverter fail signal circuit	

WIRING DIAGRAM

INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU GFIV and GIVG terminals and converter & inverter assembly G-FINV and G-GINV terminals (See page IN-41).**

HINT:
The generator inverter fail signal circuit has +B short if the voltage between the HV ECU GFIV or GIVG terminal and body ground is always more than 13 V with the ignition ON (”READY” light OFF).

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

CIRCUIT DESCRIPTION

DTC P3125 - Information code 322, 324, 325

INF. Code.	Detecting Condition	Trouble Area
322	Inverter overheating	• Converter & inverter assembly
324	Inverter circuit broken	
325	Inverter internal short	

INSPECTION PROCEDURE

If the information code 322 or 325 is output, check if other information codes are recorded. If they are recorded, check and repair those codes first.
If the information code 322 or 325 alone is recorded, replace the converter & inverter assembly.
If the information code 324 is output, replace the converter & inverter assembly.

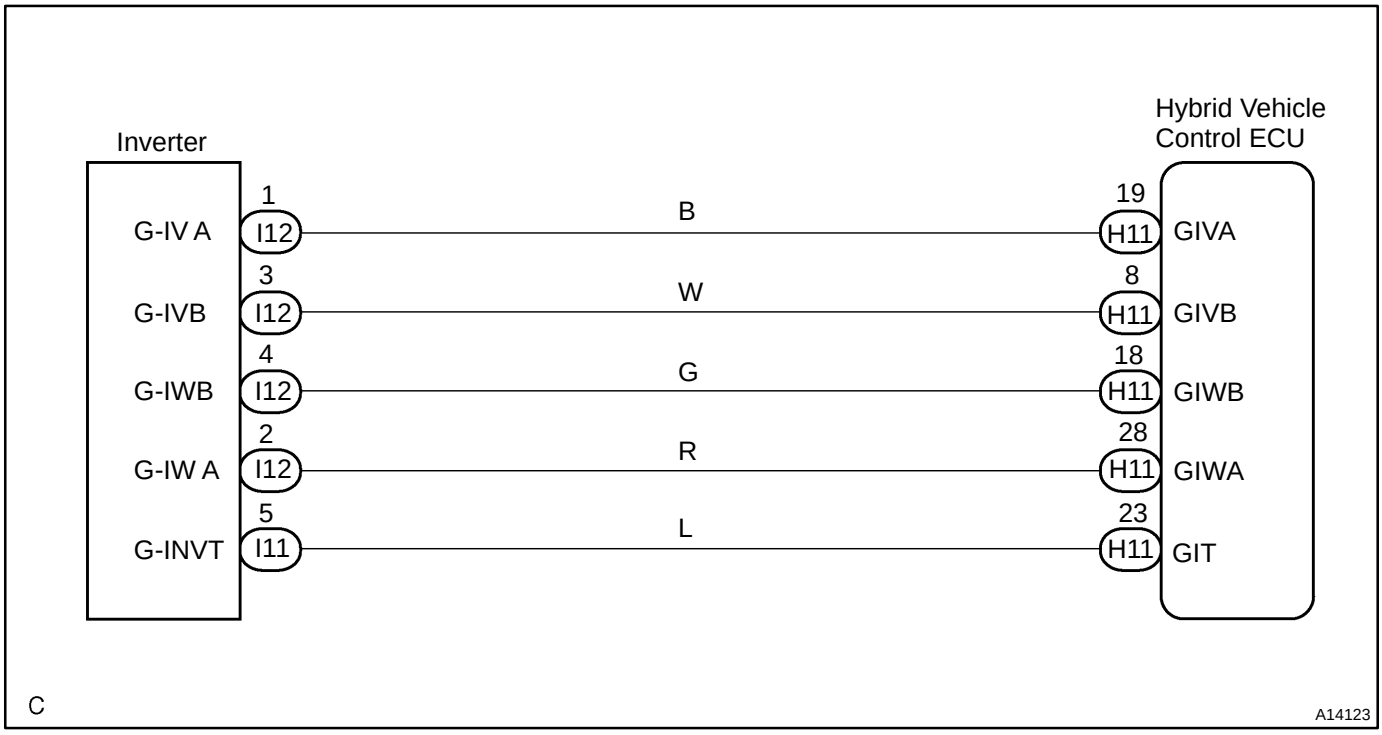
CIRCUIT DESCRIPTION

The HV ECU detects the malfunction of the generator inverter current sensor. It detects the malfunction of the sensor system, not of the high voltage system.

DTC P3125 - Information code 326, 327, 328, 330, 332, 334, 335, 336, 338, 340

INF. Code.	Detecting Condition	Trouble Area
327	Open in generator inverter current sensor (V phase sub sensor)	• Converter & inverter assembly • Wire harness
330	Open in generator inverter current sensor (V phase main sensor)	
335	Open in generator inverter current sensor (W phase sub sensor)	
338	Open in generator inverter current sensor (W phase main sensor)	
326	Generator inverter current sensor malfunction (V phase sub sensor)	
328	Generator inverter current sensor malfunction (V phase main sensor)	
332	Generator inverter current sensor V phase performance problem	
334	Generator inverter current sensor malfunction (W phase sub sensor)	
336	Generator inverter current sensor malfunction (W phase main sensor)	
340	Generator inverter current sensor W phase performance problem	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check continuity of wire harness between HV ECU and converter & inverter assembly (See page IN-41).**

OK:

Continuity: Less then 1 Ω

HV ECU Terminals	Inverter Terminals
GIVA	G-IV A
GIVB	G-IVB
GIWA	G-IW A
GIWB	G-IWB
GIVG	G-GINV

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.

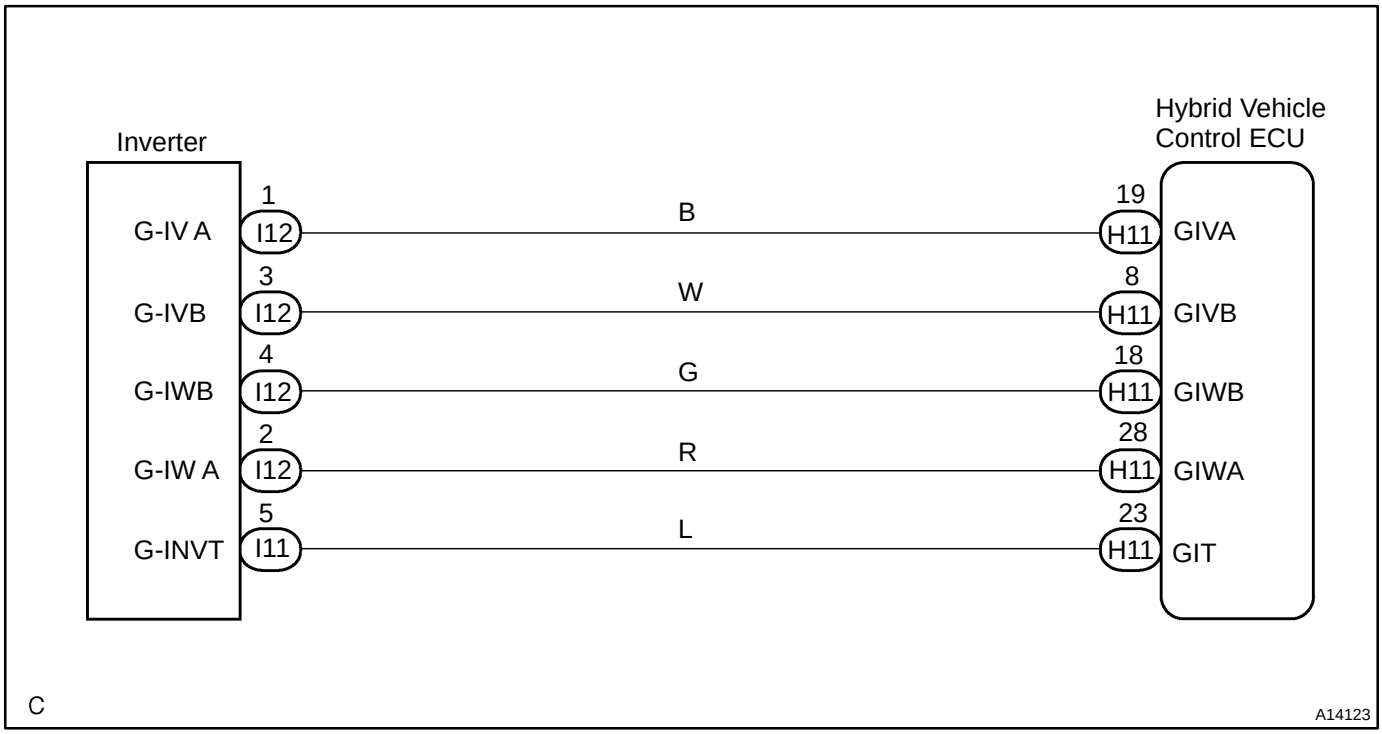
CIRCUIT DESCRIPTION

The HV ECU detects the malfunction of the generator inverter current sensor. It detects the malfunction of the sensor system, not of the high voltage system.

DTC P3125 - Information code 329, 331, 333, 337, 339, 341

INF. Code.	Detecting Condition	Trouble Area
329	When there is a history that the state of malfunction continued during inverter fail safe mode	• Converter & inverter assembly • Wire harness
331		
333		
337		
339		
341		

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check continuity of wire harness between HV ECU and converter & inverter assembly (See page IN-41).**

OK:

Continuity: Less then 1 Ω

HV ECU Terminals	Inverter Terminals
GIVA	G-IV A
GIVB	G-IVB
GIWA	G-IW A
GIWB	G-IWB
GIVG	G-GINV

NG → **Repair or replace wire harness.**

OK

2	**Is there DTC P3100 being output?**

YES → **Check applicable DTC.**

NO

Replace converter & inverter assembly.

CIRCUIT DESCRIPTION

The HV ECU detects the malfunction of the generator inverter current sensor. It detects the malfunction of the sensor system, not of the high voltage system.

DTC P3125 - Information code 344, 345

INF. Code.	Detecting Condition	Trouble Area
344	Failure in monitoring generator torque performance	• Converter & inverter assembly
345	Abnormal current value of generator	

INSPECTION PROCEDURE

If the information code 344 or 345 is output, check if other DTC or information codes are recorded. If they are recorded, check and repair those codes first.

If the information code 344 or 345 alone is recorded, replace the converter & inverter assembly.

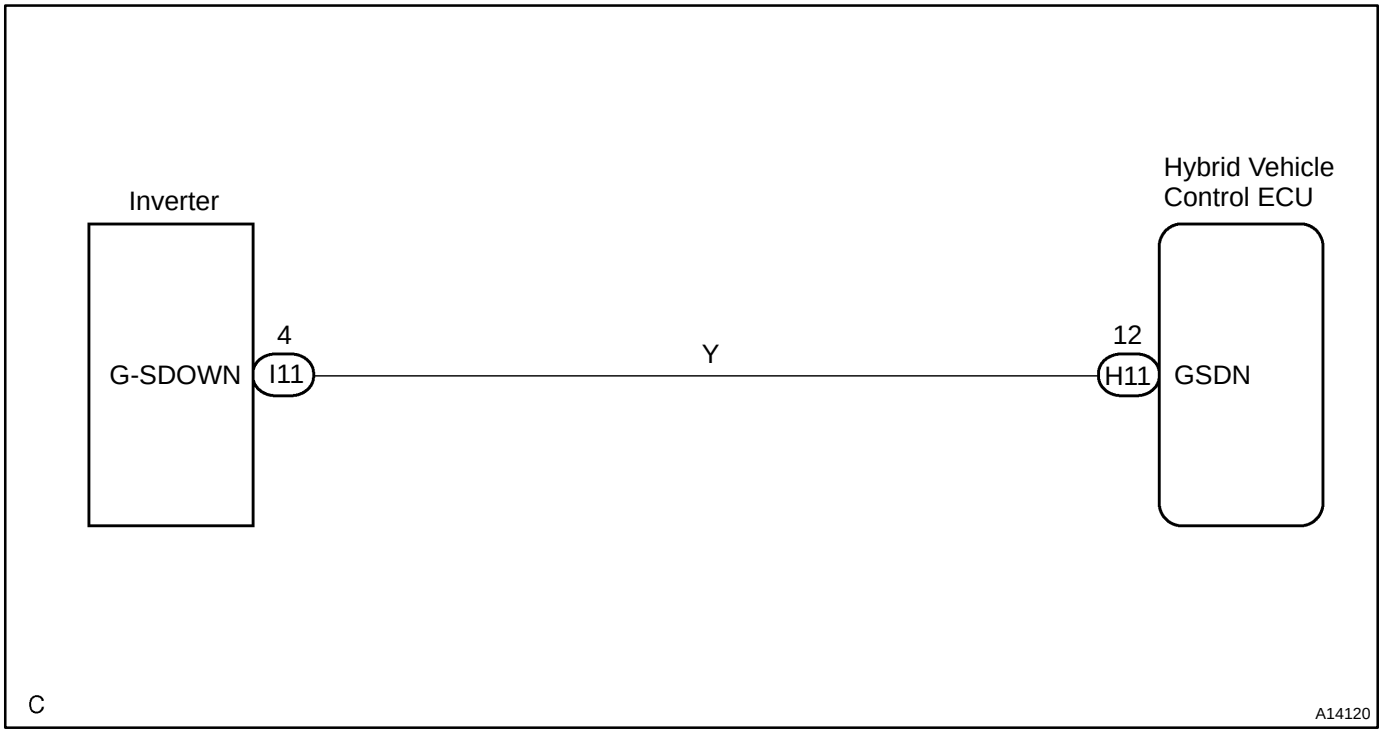
CIRCUIT DESCRIPTION

The HV ECU checks the line connection of the generator gate shutdown signal circuit and detects malfunction.

DTC P3125 - Information code 342, 343

INF. Code.	Detecting Condition	Trouble Area
342	+B short in generator gate shutdown signal circuit	• Converter & inverter assembly • Wire harness
343	Open or GND short in generator gate shutdown signal circuit	

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check for open, short and +B short in wire harness between HV ECU GSDN terminal and converter & inverter assembly G-SDOWN terminals (See page IN-41).**

HINT:
Confirm that there is no open circuit in the wire harness. The generator gate shutdown signal circuit has +B short if the battery voltage is always applied to the HV ECU GSDN terminal with the ignition ON.

NG → **Repair or replace wire harness.**

OK

Replace converter & inverter assembly.