

# ON-VEHICLE INSPECTION

## 1. INSPECT INVERTER

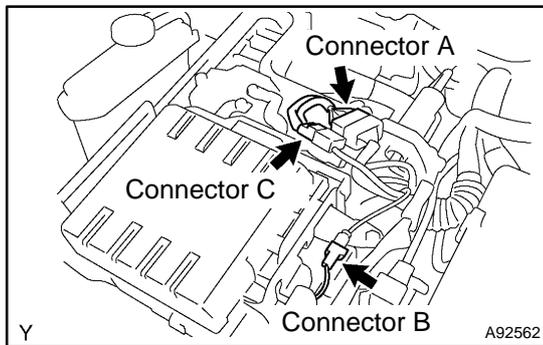
### NOTICE:

**Wear insulating gloves.**

### HINT:

Check DTCs before performing the inspections of the converter and inverter, and perform the appropriate troubleshooting.

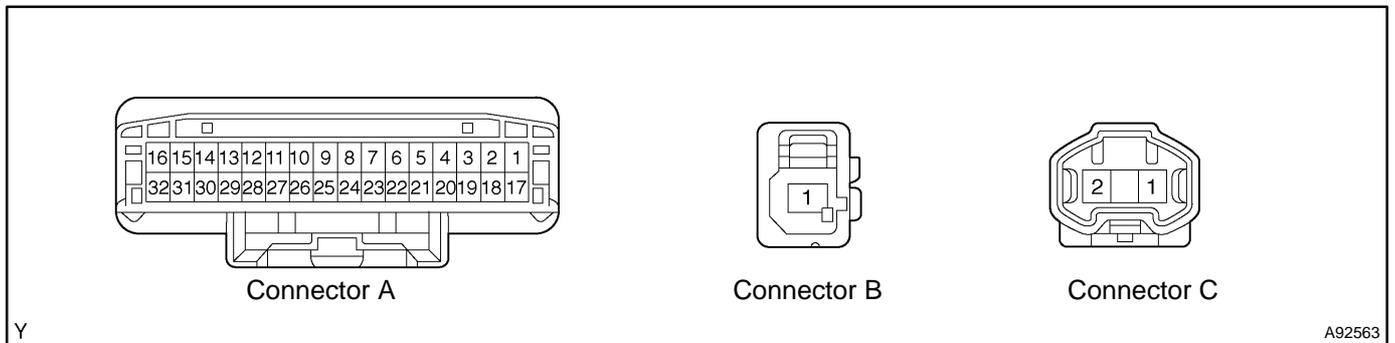
- (a) Turn the power switch OFF.
- (b) Remove the service plug grip (see page 21-116).
- (c) Remove the inverter cover (see page 21-23).



- (d) Disconnect the connectors A and B shown in the illustration.
- (e) Turn the power switch ON (IG).  
If turning the power switch ON (IG) with the service plug grip removed, the DTC of the inter lock switch system will be output.
- (f) Using a voltmeter, measure the voltage. Also, using an ohmmeter, measure the resistance.

### NOTICE:

**The inspection should be performed on the wire harness side, not on the terminal side.**

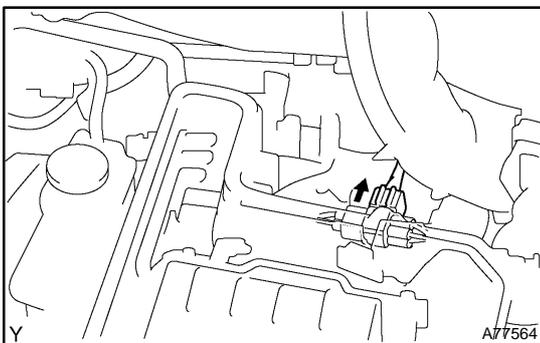
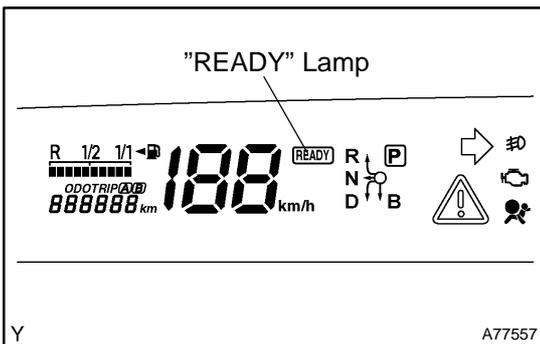
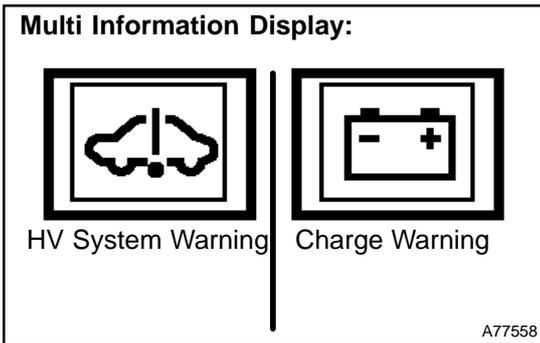
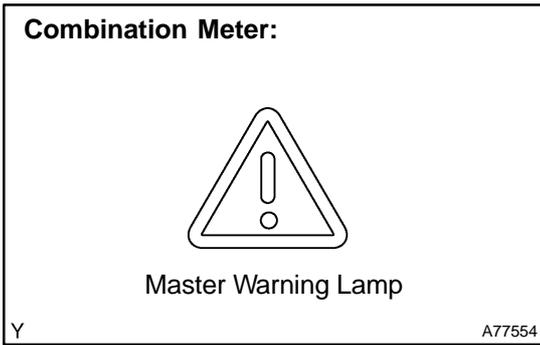


### Standard:

Tester Connection	Measuring Condition	Specified Condition
A2 - A16 (GIVA - GINV)	⊘	Approximately 0 V
A3 - A16 (GIVB - GINV)	⊘	Approximately 0 V
A4 - A16 (GUU - GINV)	⊘	Approximately 14 to 16 V
A5 - A16 (GVU - GINV)	⊘	Approximately 14 to 16 V
A6 - A16 (GWU - GINV)	⊘	Approximately 14 to 16 V
A7 - A16 (MIVA - GINV)	⊘	Approximately 0 V
A8 - A16 (MIVB - GINV)	⊘	Approximately 0 V

Tester Connection	Measuring Condition	Specified Condition
A9 – A16 (MUU – GINV)	ⓧ	Approximately 14 to 16 V
A10 – A16 (MVU – GINV)	ⓧ	Approximately 14 to 16 V
A11 – A16 (MWU – GINV)	ⓧ	Approximately 14 to 16 V
A12 – A16 (VH – GINV)	ⓧ	Approximately 0.5 V
A13 – A32 (CPWM – GCNV)	ⓧ	Approximately 0 V
A14 – A32 (GSDN – GCNV)	ⓧ	Approximately 2 to 4.5 V
A15 – A32 (VL – GCNV)	ⓧ	Approximately 0.5 V
A16 – C2 (GINV – GND)	ⓧ	Approximately 0 V
A18 – A16 (GIWA – GINV)	ⓧ	Approximately 0 V
A19 – A16 (GIWB – GINV)	ⓧ	Approximately 0 V
A20 – A16 (CT – GINV)	ⓧ	Approximately 0 V
A21 – A16 (GIVT – GINV)	ⓧ	Approximately 2 to 4.5 V
A22 – A16 (GFIV – GINV)	ⓧ	Approximately 5 to 8 V
A23 – A16 (MIWA – GINV)	ⓧ	Approximately 0 V
A24 – A16 (MIWB – GINV)	ⓧ	Approximately 0 V
A25 – A16 (MSDN – GINV)	ⓧ	Approximately 0 V
A26 – A16 (MIVT – GINV)	ⓧ	Approximately 2 to 4.5 V
A27 – A16 (MFIV – GINV)	ⓧ	Approximately 5 to 8 V
A28 – A16 (OVH – GINV)	ⓧ	Approximately 5 to 8 V
A29 – A32 (CSDN – GCNV)	ⓧ	Approximately 0 V
A30 – A32 (FCV – GCNV)	ⓧ	Approximately 13.5 to 16.5 V
A31 – A32 (OVL – GCNV)	ⓧ	Approximately 13.5 to 16.5 V
A32 – C2 (GCNV – GND)	ⓧ	Approximately 0 V
B1 – Body ground (ILK – Body ground)	After installing the probe to the terminal, temporarily install the inverter cover. It does not have to be tightened with the bolts at this point.	Below 1 Ω
C1 – C2 (IGCT – GND)	ⓧ	Approximately 8 to 16 V
C2 – Body ground (GND – Body ground)	ⓧ	Below 1 Ω

If the standards are not met, replace the w/ inverter converter assembly.



**2. INSPECT CONVERTER**

**NOTICE:**

**Wear insulating gloves.**

**HINT:**

If the HV system warning, master warning lamp and charge warning come on at the same time, check the DTCs and perform the appropriate troubleshooting.

- (a) Check the operation.
  - (1) Using a voltmeter, measure the voltage of the auxiliary battery terminal when the "READY" lamp is OFF and ON.

**Standard:**

"READY" Lamp	Voltage
ON	14 V
OFF	12 V

**HINT:**

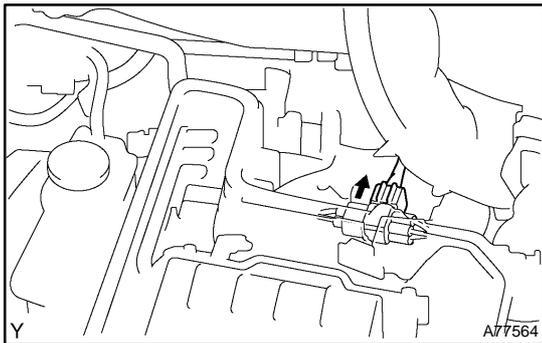
When the "READY" lamp is ON, the converter outputs the voltage. When it is OFF, the auxiliary battery outputs the voltage.

- (b) Inspect the output current.
  - (1) Disconnect the MG1 and MG2 power cables from the inverter (see page 21-23).
  - (2) Install a voltmeter and the AC/DC 400 A probe to the locations shown in the illustration.
  - (3) Connect the MG1 and MG2 power cables to the inverter (see page 21-23).
  - (4) With the "READY" lamp ON, operate the 12 V electrical devices one by one, then measure the output current.

**Standard: Approximately 80 A or less**

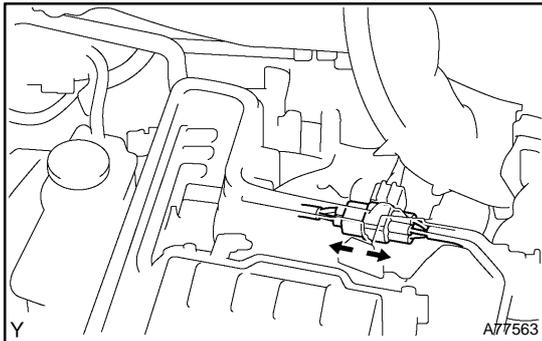
**HINT:**

If the output current is 0 A or greater than 80 A, check the input/output signal.

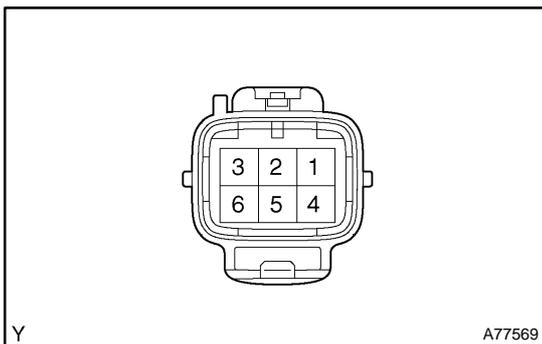


- (c) Check the input/output signal.
- (1) Disconnect the connectors shown in the illustration.
  - (2) Using a voltmeter, measure the voltage between the body ground and the terminal of the vehicle-side wire harness connector.

**Standard:**  
**Equal to the auxiliary battery terminal voltage**



- (3) Disconnect the connectors shown in the illustration.

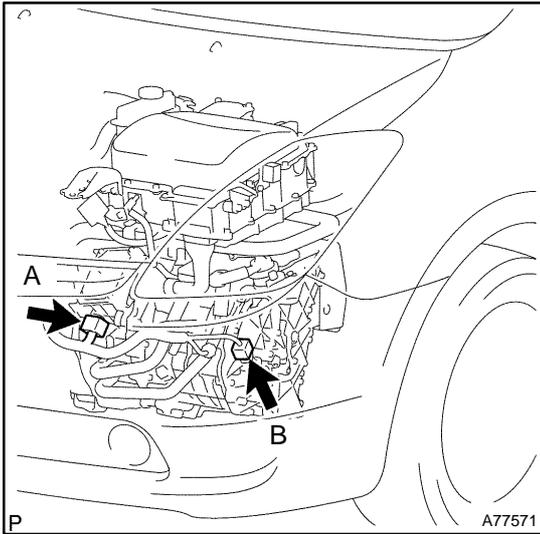


- (4) Turn the power switch ON (IG). Using a voltmeter and ohmmeter, measure the voltage and resistance between the connector terminals on the vehicle harness side.

**Standard:**

Tester Connection	Specified Condition
Terminal 5 – Body ground (IGCT – Body ground)	8 to 16 V
Terminal 3 – Body ground (S – Body ground)	Equal to the auxiliary battery voltage
Terminal 1 – Body ground (S – Body ground)	120 to 140 Ω

If the standards are not met, replace the with inverter converter assembly.



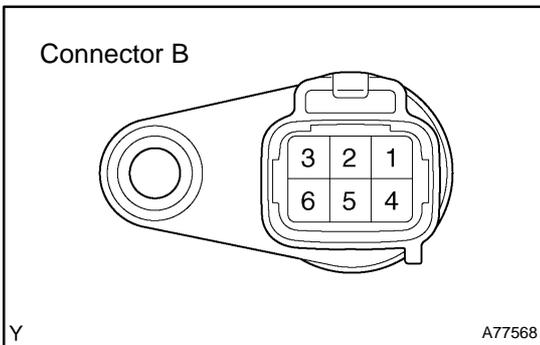
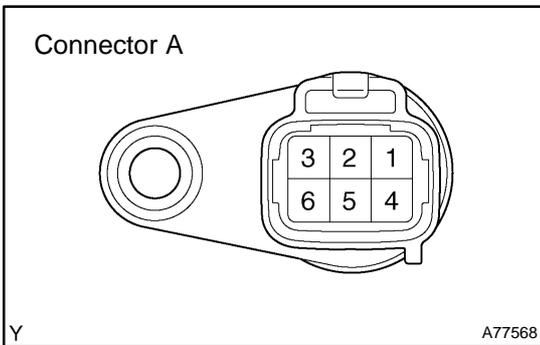
**3. INSPECT SPEED SENSOR (RESOLVER)**

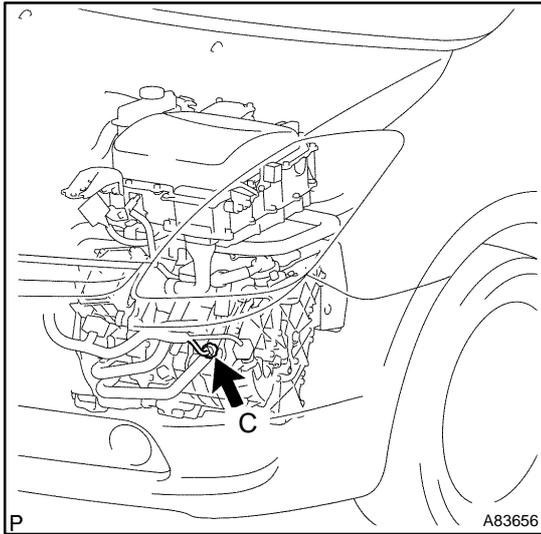
- (a) Using an ohmmeter, measure the resistance between the terminals.

**Standard:**

Tester Connection	Specified Condition
A1 – A4 (GCS – GCSG)	12.6 to 16.8 Ω
A2 – A5 (GSN – GSNG)	12.6 to 16.8 Ω
A3 – A6 (GRF – GRFG)	7.65 to 10.2 Ω
B1 – B4 (MRF – MRFG)	7.65 to 10.2 Ω
B2 – B5 (MSN – MSNG)	12.6 to 16.8 Ω
B3 – B6 (MCS – MCSG)	12.6 to 16.8 Ω
<input checked="" type="checkbox"/> All of the above terminals – <input checked="" type="checkbox"/> Transaxle housing	10 kΩ or higher

If the standards are not met, replace the hybrid vehicle trans-axle assembly.





**4. INSPECT TEMPERATURE SENSOR**

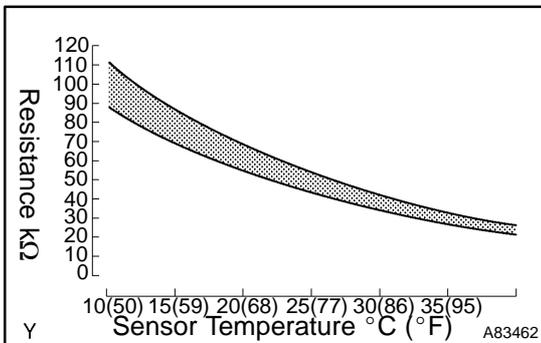
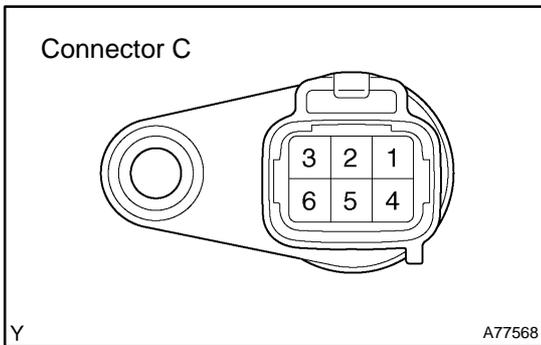
- (a) Using an ohmmeter, measure the resistance between the terminals.

**Standard:**

Tester Connection	Specified Condition
C1 – C4 (MMT – MMTG)	87.3 to 110.5 kΩ at 10°C(50°F) 23.8 to 28.5 kΩ at 40°C (104°F)
C3 – C6 (OMT – OMTG)	87.3 to 110.5 kΩ at 10°C(50°F) 23.8 to 28.5 kΩ at 40°C (104°F)
<input checked="" type="checkbox"/> All of the above terminals – <input checked="" type="checkbox"/> Transaxle housing	1 MΩ or higher

**HINT:**

The standard varies according to the sensor temperature. If the standards are not met, replace the hybrid vehicle trans-axle assembly.

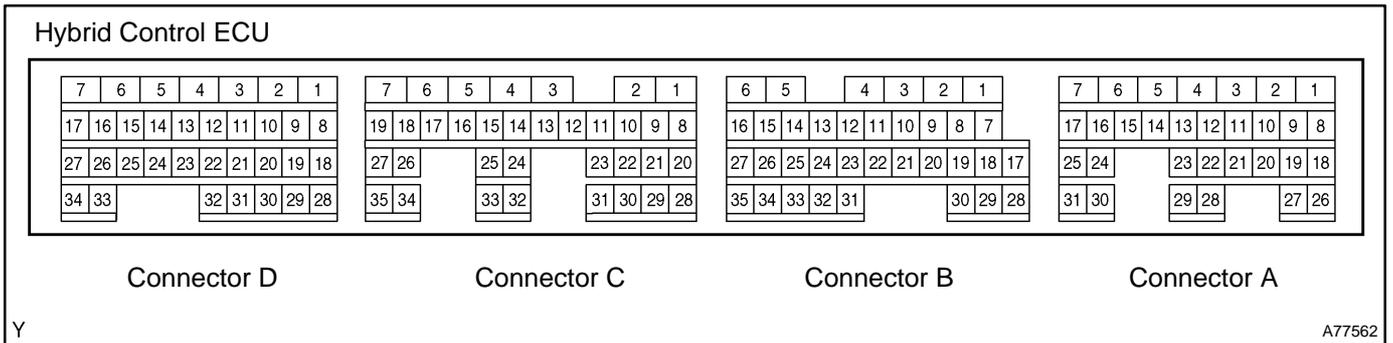


**5. INSPECT ACCELERATOR POSITION**

**NOTICE:**

- Do not remove the accelerator position sensor from the accelerator pedal.
- Perform the inspection on the hybrid vehicle control ECU side of the connector.

- (a) Turn the power switch ON (IG).
- (b) Using a voltmeter, measure the voltage between the terminals.



**Standard:**

Terminals	Measuring Condition	Specified Condition
B25 – B27 (VCP1 – EP1)	Normal	4.5 to 5.5 V
B26 – B27 (VPA1 – EP1)	Do not depress the accelerator pedal	0.5 to 1.1 V
B26 – B27 (VPA1 – EP1)	Gradually depress the accelerator pedal	The voltage increases slowly
B26 – B27 (VPA1 – EP1)	Fully depress the accelerator pedal	2.6 to 4.5 V
B33 – B35 (VCP2 – EP2)	Normal	4.5 to 5.5 V
B34 – B35 (VPA2 – EP2)	Do not depress the accelerator pedal	1.2 to 2.0 V
B34 – B35 (VPA2 – EP2)	Gradually depress the accelerator pedal	The voltage increases slowly
B34 – B35 (VPA2 – EP2)	Fully depress the accelerator pedal	3.4 to 5.3 V

If the standards are not met, replace the accelerator pedal rod assembly.