DTC	P0A3F/243	DRIVE MOTOR ”A” POSITION SENSOR CIRCUIT

DTC	P0A40/500	DRIVE MOTOR ”A” POSITION SENSOR CIRCUIT RANGE/PERFORMANCE

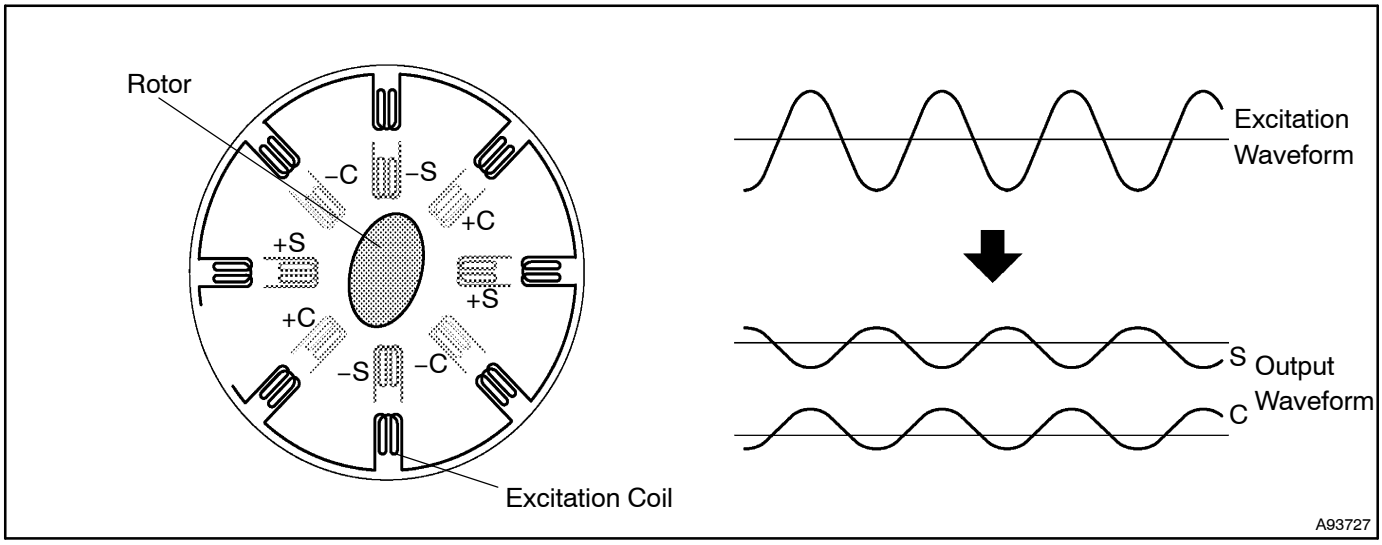
DTC	P0A41/245	DRIVE MOTOR ”A” POSITION SENSOR CIRCUIT LOW

CIRCUIT DESCRIPTION

The motor resolver is a type of sensor that detects the position of the magnetic poles, which are indispensable for ensuring the highly efficient control of the MG1 and MG2.

The stator of the resolver contains an excitation coil and two detection coils. Because the rotor has an oval shape, the gap between the stator and the rotor changes as the rotor turns. An alternating current with a predetermined frequency flows through the excitation coil, and detection coils S and C output alternating currents in accordance with the position of the sensor rotor.

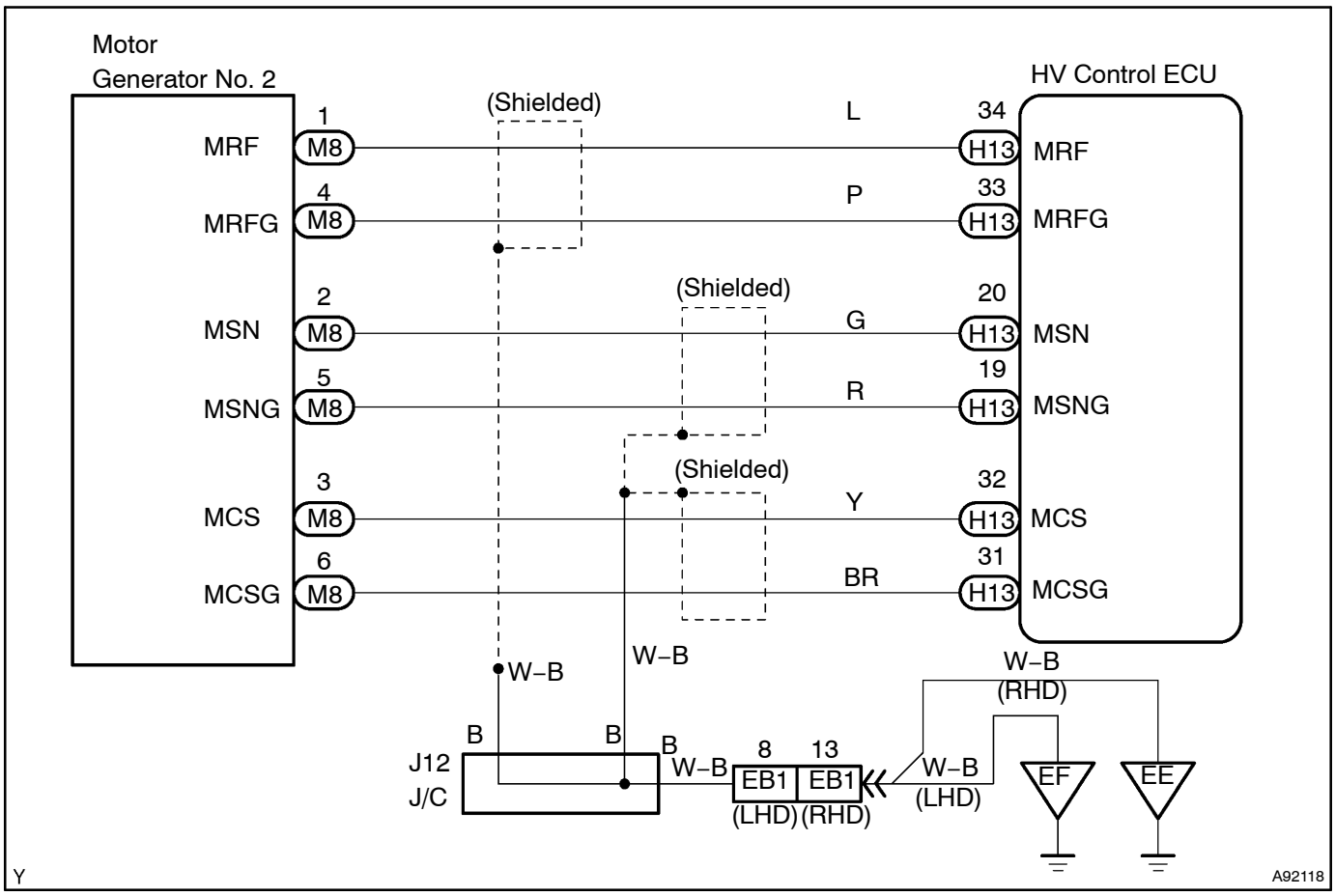
The HV control ECU detects the absolute position of the rotor in accordance with the phases of detection coils S and C and the height of their waveform. Furthermore, the CPU calculates the amount of change in the position within a predetermined length of time, in order to use the resolver as a speed sensor.



The HV control ECU monitors the output signals of the motor resolver and detects malfunction.

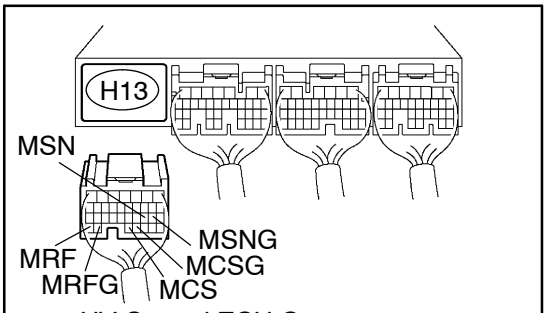
DTC No.	INF Code	DTC Detection Condition	Trouble Area
P0A3F	243	Interphase short in motor resolver circuit	• Wire harness or connector • Hybrid vehicle motor • HV control ECU
P0A40	500	Motor resolver output is out of normal range	• Wire harness or connector • Hybrid vehicle motor • HV control ECU
P0A41	245	Open or short in motor resolver circuit	• Wire harness or connector • Hybrid vehicle motor • HV control ECU

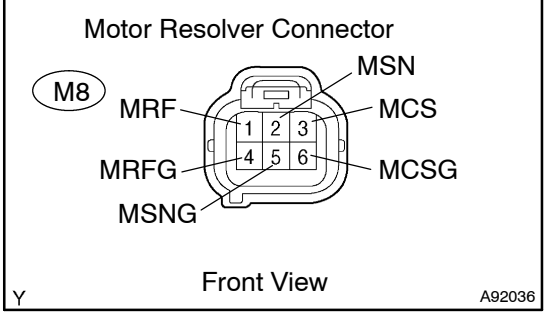
WIRING DIAGRAM



INSPECTION PROCEDURE

1	CHECK HARNESS AND CONNECTOR(HYBRID VEHICLE CONTROL ECU – MOTOR RESOLVER)





(a) Disconnect the H13 HV control ECU connector.
(b) Disconnect the M8 motor resolver connector.
(c) Turn the power switch ON (IG).
(d) Measure the voltage between the terminals of the HV control ECU connector and body ground.

Standard:

Tester Connection	Specified Condition
MRF (H13–34) – Body ground	Below 1 V
MRFG (H13–33) – Body ground	Below 1 V
MSN (H13–20) – Body ground	Below 1 V
MSNG (H13–19) – Body ground	Below 1 V
MCS (H13–32) – Body ground	Below 1 V
MCSG (H13–31) – Body ground	Below 1 V

(e) Turn the power switch OFF.
(f) Check the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
MRF (H13–34) – MRF (M8–1)	Below 1 Ω
MRFG (H13–33) – MRFG (M8–4)	Below 1 Ω
MSN (H13–20) – MSN (M8–2)	Below 1 Ω
MSNG (H13–19) – MSNG (M8–5)	Below 1 Ω
MCS (H13–32) – MCS (M8–3)	Below 1 Ω
MCSG (H13–31) – MCSG (M8–6)	Below 1 Ω

Standard (Check for short):

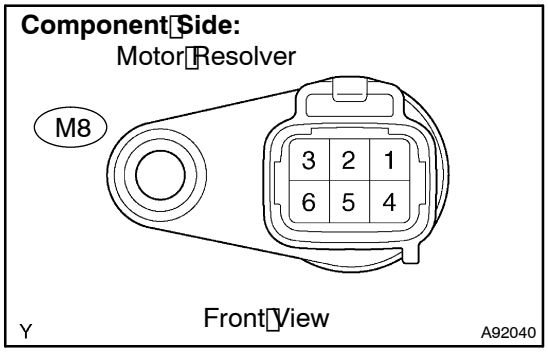
Tester Connection	Specified Condition
MRF (H13–34) or MRF (M8–1) – Body ground	10 kΩ or higher
MRFG (H13–33) or MRFG (M8–4) – Body ground	10 kΩ or higher
MSN (H13–20) or MSN (M8–2) – Body ground	10 kΩ or higher
MSNG (H13–19) or MSNG (M8–5) – Body ground	10 kΩ or higher
MCS (H13–32) or MCS (M8–3) – Body ground	10 kΩ or higher
MCSG (H13–31) or MCSG (M8–6) – Body ground	10 kΩ or higher

(g) Reconnect the motor resolver connector.
(h) Reconnect the HV control ECU connector.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

2	INSPECT MOTOR RESOLVER



(a) Measure the resistance between the terminals of the motor resolver.

Standard:

Tester Connection	Specified Condition
MRF (M8–1) – MRFG (M8–4)	7.65 to 10.2 Ω
MSN (M8–2) – MSNG (M8–5)	12.6 to 16.8 Ω
MCS (M8–3) – MCSG (M8–6)	12.6 to 16.8 Ω
Each terminal listed above – Transaxle housing	10 kΩ or higher

NG → **REPLACE HYBRID VEHICLE MOTOR ASSY**

OK

REPLACE HYBRID VEHICLE CONTROL ECU (See page 21–128)