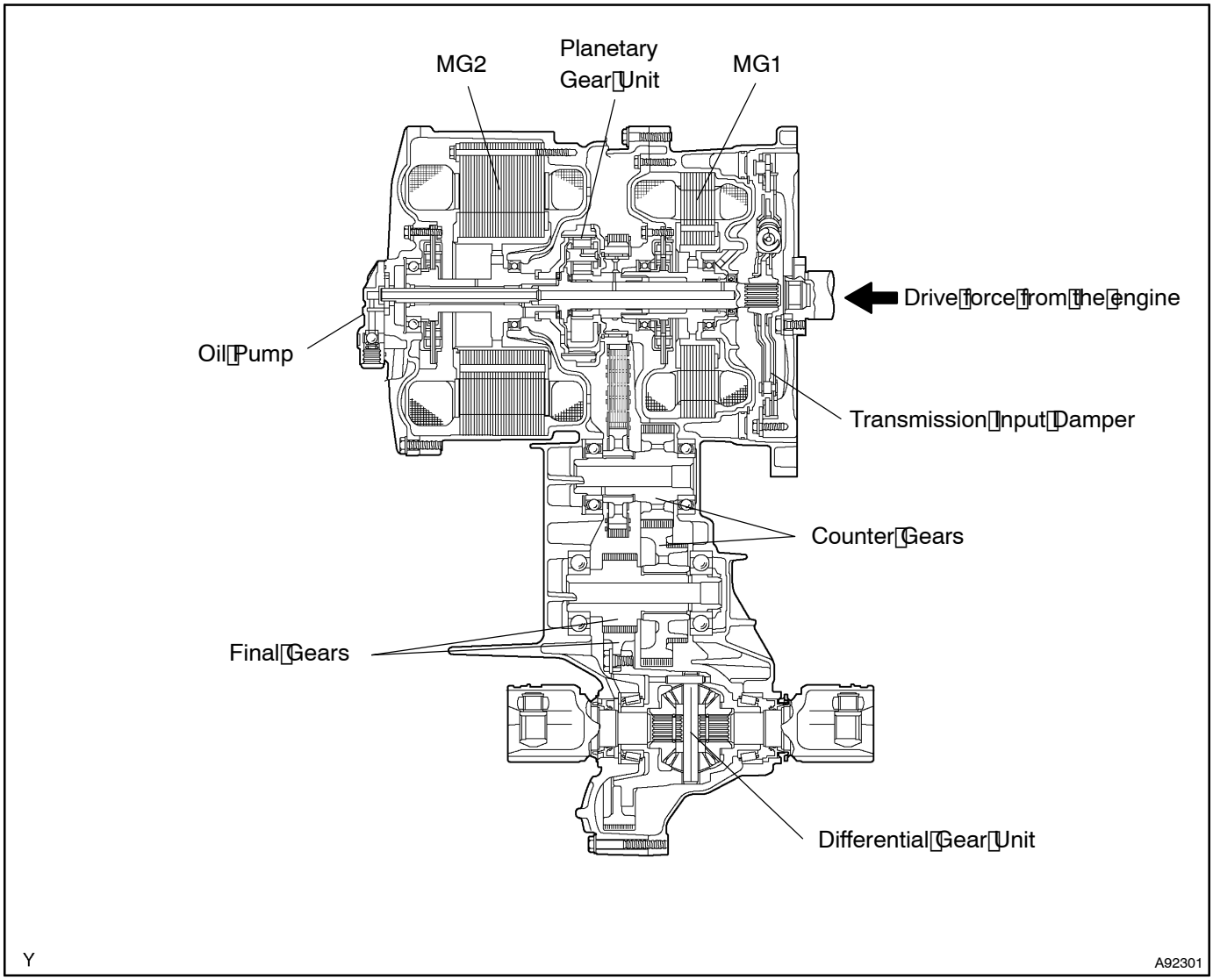
DTC	P0A90/239	DRIVE MOTOR ”A” PERFORMANCE

DTC	P0A90/241	DRIVE MOTOR ”A” PERFORMANCE

DTC	P0A90/602	DRIVE MOTOR ”A” PERFORMANCE

CIRCUIT DESCRIPTION

The HV transaxle consists of a planetary gear unit, MG1, and MG2.
A gear unit uses the planetary gear to split engine output in accordance with a driving request during driving the vehicle or charging its internal HV battery.
The MG2 provides assist to the engine output while increasing the drive force of the vehicle. Furthermore, the MG2 effects regenerative braking by converting the energy (which is consumed in the form of heat during normal braking) into electrical energy and recovering it into the HV battery. Through regenerative braking, as well as decelerating the vehicle, the MG2 generates high–voltage electrical power which is used for the purpose of charging the HV battery.
The MG1 supplies electrical power, which is used for charging the HV battery or for driving the MG2. It also has a stepless transmission function to control the transaxle by regulating the amount of generation of electrical energy, which effectively varies the MG1 speed. In addition, the MG1 is used as a starter motor to start the engine.
The transmission input damper absorbs the shock that accompanies transmission of the drive force from the engine.



DTC No.	INF Code	DTC Detection Condition	Trouble Area
P0A90	239	HV transaxle input malfunction (shaft damaged)	• Engine assembly • HV transaxle assembly (shaft or gear) • Transmission input damper • Wire harness or connector • HV control ECU
P0A90	241	HV transaxle input malfunction (torque limiter slipping)	• Engine assembly • HV transaxle assembly (shaft or gear) • Transmission input damper • Wire harness or connector • HV control ECU
P0A90	602	HV transaxle output malfunction	• Engine assembly • HV transaxle assembly (shaft or gear) • Transmission input damper • Wire harness or connector • HV control ECU

WIRING DIAGRAM

Refer to DTC P0A0F (INF 238) on page 05–315.

INSPECTION PROCEDURE

1	READ OUTPUT DTC(ENGINE)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the intelligent tester II, enter the following menus: Powertrain / Engine and ECT / DTC.
(e) Read DTCs.
Result: DTCs are output

YES	GO TO RELEVANT DTC CHART (See page 05–39)

NO

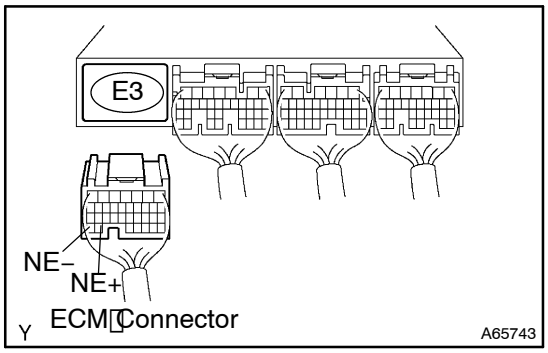
2	CHECK CRANKSHAFT PULLEY REVOLUTION

(a) Turn the power switch OFF.
(b) Jack up the vehicle.
(c) Manually turn the crankshaft pulley to check if the crankshaft rotates.
OK: The crankshaft rotates

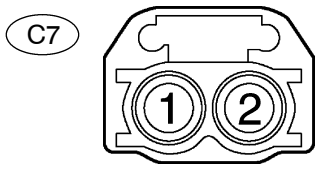
NG	Go to step 10

OK

3	CHECK HARNESS AND CONNECTOR(ECM – CRANKSHAFT POSITION SENSOR)



Wire Harness Side:
Crankshaft Position Sensor Connector



(a) Disconnect the E3 ECM connector.
(b) Disconnect the C7 crankshaft position sensor connector.
(c) Check the resistance between the wire harness side connectors.
Standard (Check for open):

Tester Connection	Specified Condition
NE+ (E3–33) – Crankshaft position sensor (C7–1)	Below 1 Ω
NE– (E3–34) – Crankshaft position sensor (C7–2)	Below 1 Ω

Standard (Check for short):

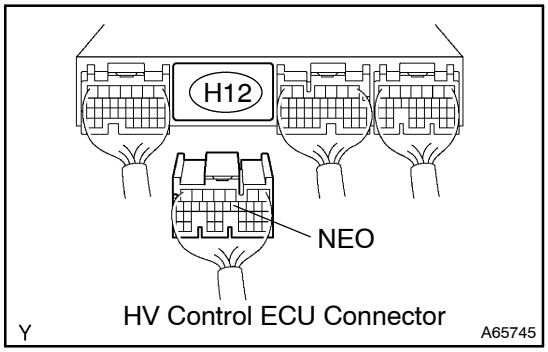
Tester Connection	Specified Condition
NE+ (E3–33) or Crankshaft position sensor (C7–1) – Body ground	10 kΩ or higher
NE– (E3–34) or Crankshaft position sensor (C7–2) – Body ground	10 kΩ or higher

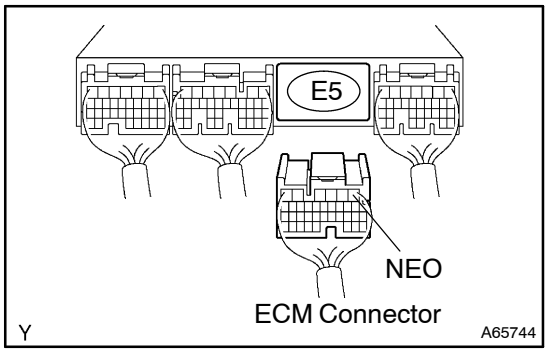
(d) Reconnect the crankshaft position sensor connector.
(e) Reconnect the ECM connector.

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4 CHECK HARNESS AND CONNECTOR(HYBRID VEHICLE CONTROL ECU – ECM)





(a) Disconnect the H12 HV control ECU connector.
(b) Disconnect the E5 ECM connector.
(c) Check the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
NEO (H12–12) – NEO (E5–1)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
NEO (H12–12) or NEO (E5–1) – Body ground	10 kΩ or higher

(d) Reconnect the ECM connector.
(e) Reconnect the HV control ECU connector.

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

OK

5 CHECK AND CLEAR DTC(HYBRID CONTROL)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / DTC.
(e) Check and record the DTCs, the freeze frame data, and the information.
(f) Clear the DTCs of Hybrid Control.

GO

6 CHECK READY LAMP ON

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / Data List.
(e) Read the Generator (MG1) Rev and Engine Spd values.
(f) Turn the power switch ON (READY).

OK: READY lamp turns ON

HINT:
If the READY lamp does not turn ON, and the reading on the intelligent tester II shows DTC P0A90 (INF 239) (HV transaxle input malfunction [shaft damaged]), or the MG1 turns but the engine does not crank, replace the hybrid vehicle transaxle assembly.

NG → REPLACE HYBRID VEHICLE TRANSAXLE ASSY (See page 22–11)

OK

7 CHECK ENGINE REV–UP

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / Data List.
(e) Read the Generator (MG1) Rev and Engine Spd values.
(f) With the READY lamp turned ON, depress the accelerator pedal for 10 seconds while the shift position is in the P position.

OK: The engine revs up

HINT:

If the engine does not rev up, and the reading on the intelligent tester II shows DTC P0A90 (INF 239) (HV transaxle input malfunction [shaft damaged]), or the MG1 turns but the engine does not crank, replace the hybrid vehicle transaxle assembly.

NG → REPLACE HYBRID VEHICLE TRANSAXLE ASSY (See page 22–11)

OK

8 CHECK CREEP MOVEMENT

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (READY).
(c) Jack up the vehicle.
(d) Depress the brake pedal, move the selector lever to the D position, and release the brake pedal.

OK: The wheels turn (creep movement)

HINT:

If the wheels do not turn, and the reading on the intelligent tester II shows DTC P0A90 (INF 602) (HV transaxle output malfunction), replace the hybrid vehicle transaxle assembly.

NG → REPLACE HYBRID VEHICLE TRANSAXLE ASSY (See page 22–11)

OK

9	CHECK ENGINE ACCELERATION SPEED

(a) Connect the intelligent tester II to the DLC3.
(b) While driving at the vehicle speed of more than 10 km/h (6 mph), fully depress the accelerator pedal to raise the engine speed.
OK: The engine speed increases smoothly

HINT:
If the engine over–revs or the reading on the intelligent tester II shows DTC P0A90 (INF 241) (HV transaxle input malfunction [torque limiter slipping]), replace the transmission input damper.

NG → **REPLACE TRANSMISSION INPUT DAMPER ASSY**

OK

PERFORM SIMULATION TEST. IF SYMPTOM IS NOT REPRODUCED, REPLACE HV TRANSAXLE AND HV CONTROL ECU

10	CHECK FRONT TIRE REVOLUTION

(a) Turn the power switch ON (IG).
(b) Depress the brake pedal, move the selector lever to the N position.
(c) Jack up the vehicle.
(d) Manually turn the crankshaft pulley to check if the front tires rotate.
OK: The front tires rotate

NG → **REPAIR OR REPLACE ENGINE ASSY**

OK

REPAIR OR REPLACE HYBRID VEHICLE TRANSAXLE ASSY