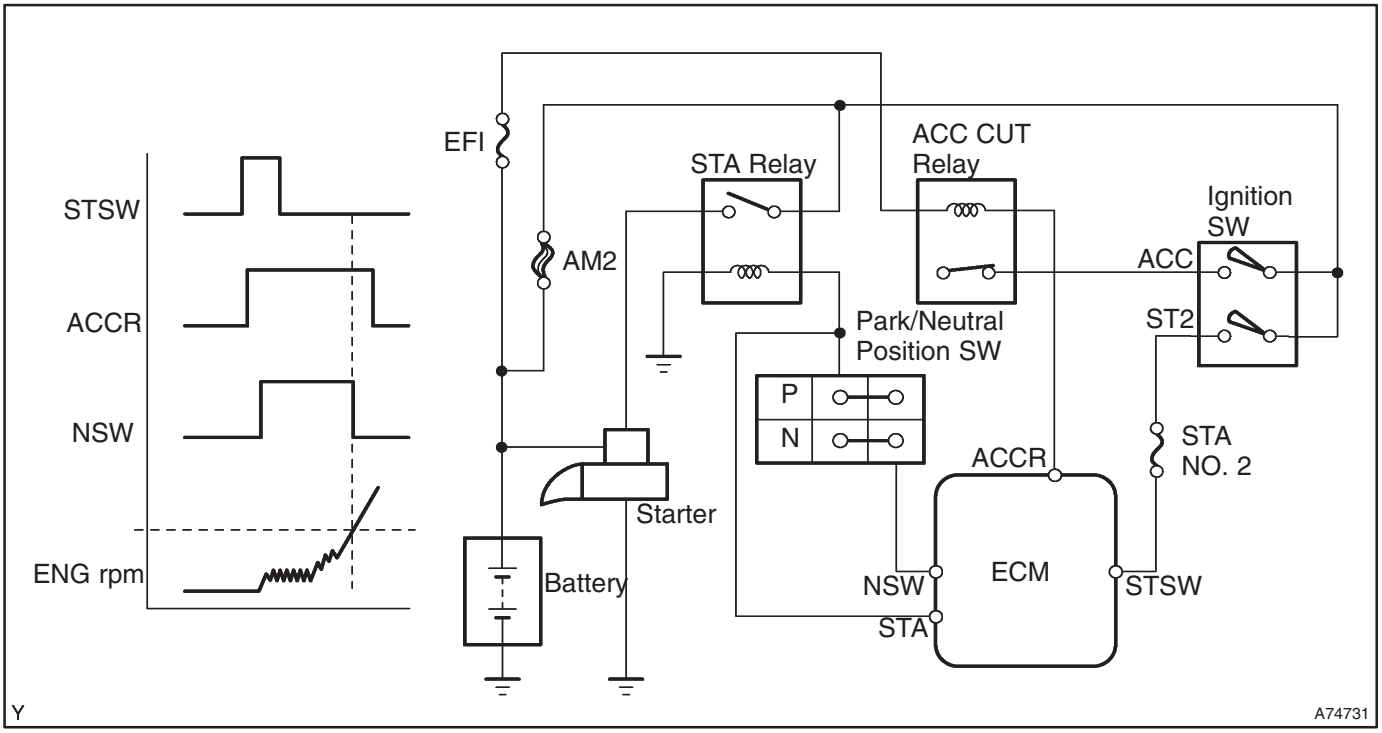
CRANKING HOLDING FUNCTION CIRCUIT

CIRCUIT DESCRIPTION

The system detects the ignition switch's starting signal (STSW signal) and then supplies current to the starter until the ECM judges that the engine has started successfully. The purpose is to reduce the holding time of the ignition key.



WIRING DIAGRAM

Refer to DTC P0617 on page 05–344.

INSPECTION PROCEDURE

1	CHECK OPERATION OF ENGINE CRANKING

(a) When turning the ignition switch to the START position, check whether the starter motor starts.

OK	CHECK FOR INTERMITTENT PROBLEMS (See page 05–199)

NG

2 READ VALUE OF INTELLIGENT TESTER II(STA SIGNAL)

(a) Connect the Intelligent Tester ll to the DLC3.
(b) Turn the ignition switch ON and turn the Intelligent Tester ll ON.
(c) Select the following menu items: Powertrain / Engine and ECT / Data List / Starter SIG.
(d) Check the result when the engine switch is turned to the ON and START.

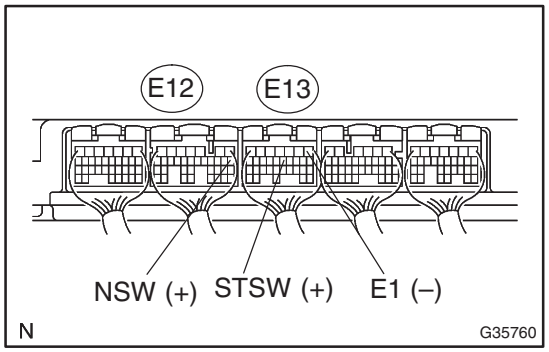
Standard:

Ignition Switch Position	ON	START
STARTER SIG	OFF	ON

OK → **Go to step 5**

NG

3 INSPECT ECM(STAR AND STSW VOLTAGE)



(a) Measure the voltage between the terminals of the E12 and E13 ECM connectors, while cranking the engine (ignition switch START position).

Standard:

Symbols (Terminal No.)	Specified condition
NSW (E12–8) – E1 (E13–1)	9 to 14 V
STSW (E13–12) – E1 (E13–1)	9 to 14 V

Result:

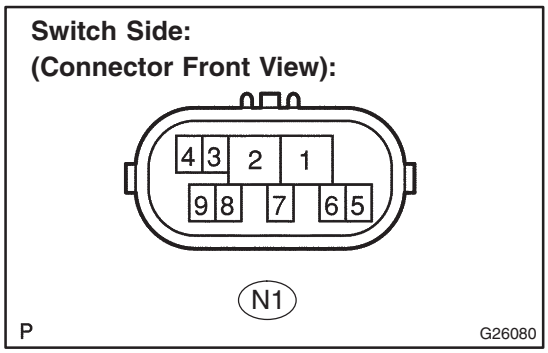
Terminal STAR	Terminal STSW	Proceed to
9 to 14 V	9 to 14 V	A
0 V	9 to 14 V	B
0 V	0 V	C

B → **REPLACE ECM (See Pub. No. RM1017E, page 10–11)**

C → **Go to step 9**

A

4 INSPECT PARK/NEUTRAL POSITION SWITCH ASSY



(a) Disconnect the park/neutral position switch connector.
(b) Check for resistance between each terminal shown below when the shift lever is moved to each range.

Standard:

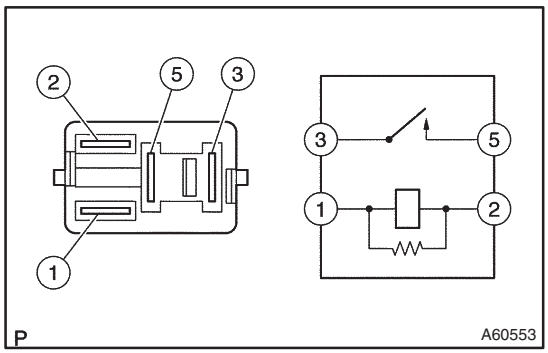
Shift Position	Tester Connection	Specified Condition
P	2 – 6 and 4 – 5	Below 1 Ω
R	2 – 1	Below 1 Ω
N	2 – 9 and 4 – 5	Below 1 Ω
D and 4	2 – 7	Below 1 Ω
3	2 – 3	Below 1 Ω
2 and L	2 – 8	Below 1 Ω

NG → **REPLACE PARK/NEUTRAL POSITION SWITCH**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH – ECM)

5 INSPECT STARTER RELAY



(a) Remove the starter relay from the engine room R/B.
(b) Inspect the starter relay.

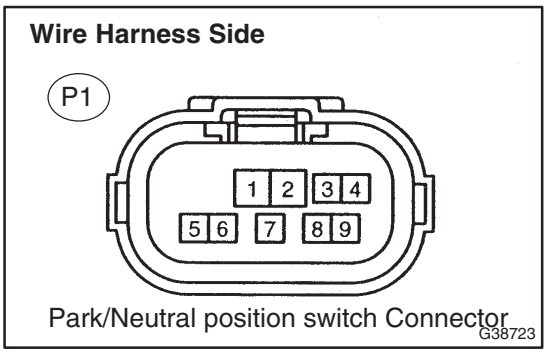
Standard:

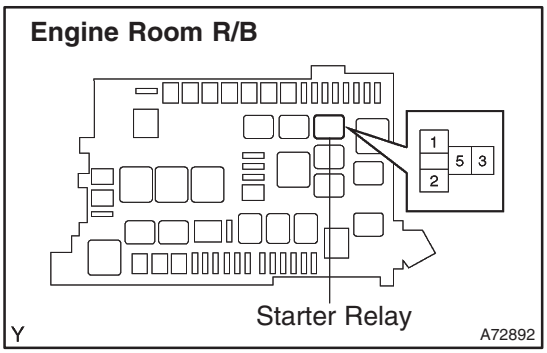
Terminal No.	Specified condition
3 – 5	10 kΩ or higher
3 – 5	Below 1 Ω (Apply battery voltage terminals 1 and 2)

NG → **REPLACE STARTER RELAY**

OK

6 CHECK HARNESS AND CONNECTOR(PARK/NEUTRAL POSITION SWITCH – STARTER RELAY, STARTER RELAY)





(a) Check the harness and the connector between the park/neutral position switch connector and the starter relay.
  (1) Disconnect the park/neutral position switch connector.
  (2) Remove the starter relay from the engine room R/B.
  (3) Check for resistance between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
Park/Neutral position switch (N1–5) – Starter relay (1)	Below 1 Ω

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
Park/Neutral position switch (N1–5) or Starter relay (1) – Body ground	10 kΩ or higher

(b) Check the harness and the connector between the starter relay and the body ground.
  (1) Remove the starter relay from the engine room R/B.
  (2) Check for resistance between the starter relay and the body ground.

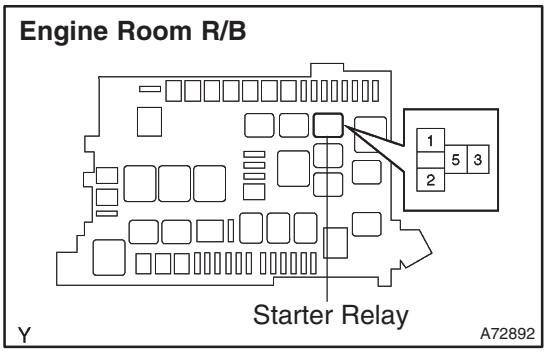
Standard (Check for open):

Symbols (Terminal No.)	Specified condition
Starter relay (2) – Body ground	Below 1 Ω

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

OK

7 INSPECT ENGINE ROOM RELAY BLOCK(STARTER RELAY VOLTAGE)



(a) Remove the starter relay from the engine room R/B.
(b) Measure the voltage between the terminal of the engine room R/B and the body ground.

Standard:

Symbols (Terminal No.)	Specified condition
Starter relay (5) – Body ground	9 to 14 V

NG → **CHECK AND REPAIR HARNESS AND CONNECTOR**

OK

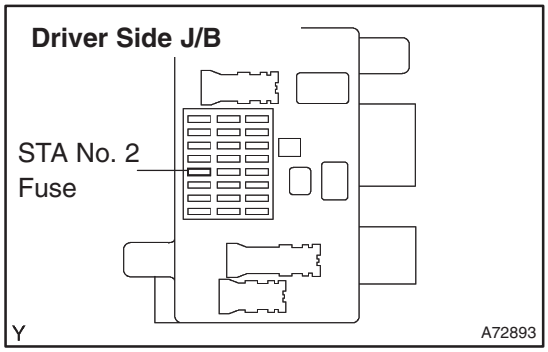
8 INSPECT STARTER ASSY (See Pub. No. RM1017E, page 19–1)

NG → **REPAIR OR REPLACE STARTER ASSY**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR (STARTER RELAY – STARTER, STARTER – BATTERY)

9	CHECK FUSE(STA NO.2)

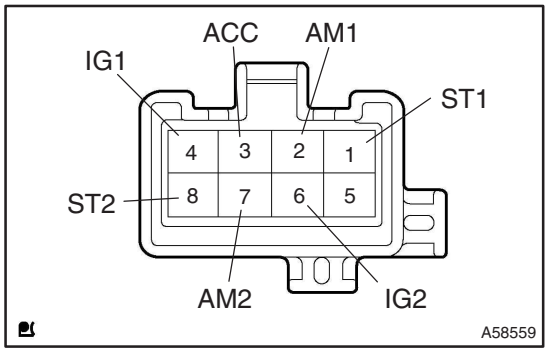


(a) Remove the STA No. 2 fuse from the driver side J/B.
(b) Check for resistance in the STA No. 2 fuse.
Standard: Below 1 Ω

NG → **CHECK FOR SHORT IN ALL HARNESSES AND COMPONENTS CONNECTED FUSE AND REPLACE FUSE**

OK

10	INSPECT IGNITION OR STARTER SWITCH ASSY



(a) Check for resistance between the connector terminals shown in the chart below.
Standard:

Switch position	Terminal No.	Specified condition
LOCK	All terminal to terminal	10 kΩ or higher
ACC	2 – 3	Below 1 Ω
ON	2 – 3, 2 – 4, 3 – 4 6 – 7	Below 1 Ω
START	1 – 2, 1 – 4, 2 – 4 6 – 7, 6 – 8, 7 – 8	Below 1 Ω

NG → **REPLACE IGNITION OR STARTER SWITCH ASSY**

OK

CHECK AND REPAIR HARNESS AND CONNECTOR (ECM – IGNITION SWITCH, IGNITION SWITCH – BATTERY)