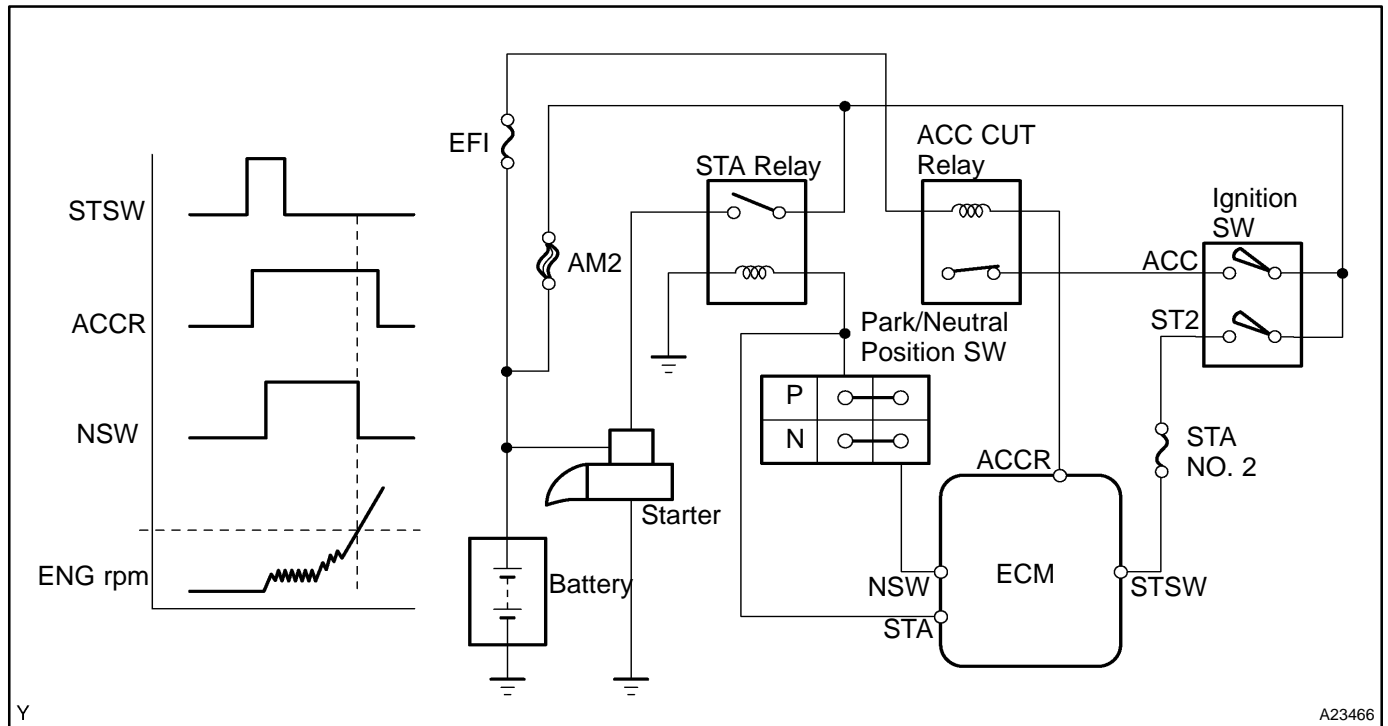


Cranking Holding Function Control Circuit

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 [DI-276](#).

INSPECTION PROCEDURE

- 1 Check operation of engine cranking.

CHECK:

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

OK:

Engine is cranked.

OK

Check for intermittent problems
(See page [DI-11](#)).

NG

2 Connect hand-held tester, and check STA signal.

PREPARATION:

- Connect the hand-held tester to the DLC3.
- Turn the ignition switch to ON, and push the hand-held tester main switch ON.
- On the hand-held tester, enter the following menu: DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL / STARTER SIG.

CHECK:

Read the STA signal on the hand-held tester while the starter operates.

OK:

Standard:

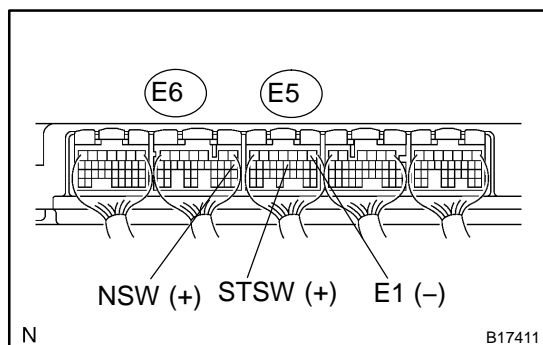
Ignition Switch Position	ON	START
STARTER SIG	OFF	ON

NG

Repair or replace harness or connector.

OK

3 Check voltage between terminals STSW and STAR/NSW of ECM connector.



- Measure the voltage between the terminals of the E6 and E5 ECM connectors, while cranking the engine (ignition switch START position).

Standard:

Symbols (Terminal No.)	Specified condition
NSW (E6-8) – E1 (E5-1)	9 to 14 V
STSW (E5-12) – E1 (E5-1)	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 page [SF-66](#)).

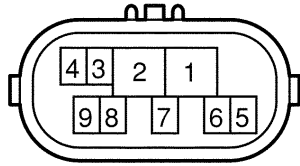
C

Go to step 8.

A

4 Check park/neutral position switch assembly.

Component Side:



P

D14154

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

Standard:

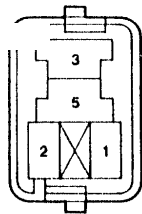
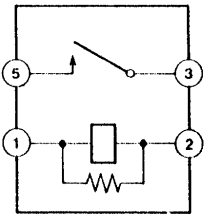
Shift range	Terminal No.	Specified condition
P	1 – 3 6 – 9	Below 1 Ω
R	2 – 3	Below 1 Ω
N	3 – 5 6 – 9	Below 1 Ω
D	3 – 7	Below 1 Ω
3	3 – 4	Below 1 Ω
2, L	3 – 8	Below 1 Ω

NG

Check and repair harness and connector.

OK

5 Check starter relay.



A19288

- Remove the starter relay from the engine room R/B.
- Inspect the starter relay.

Standard:

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

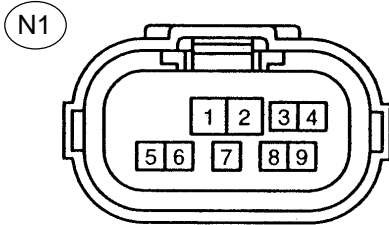
NG

Replace starter relay.

OK

6 Check harness and connector park/neutral position switch and starter relay.

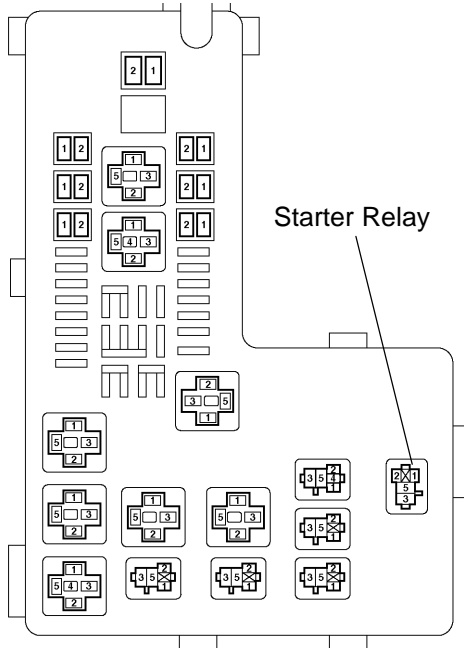
Wire Harness Side



Park/Neutral position switch Connector

A23563

Engine Room R/B:



N

A23461

- (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 (N1-6) – Starter relay (1)	Below 1 Ω

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
Park/Neutral position switch (N1-6) or Starter relay (1) – Body ground	10 k Ω 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 Check starter assembly (See page [ST-12](#) (1.6 kw) or [ST-24](#) (2.0 kw))

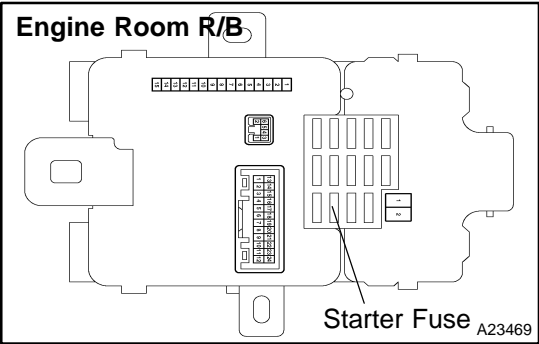
NG

Replace starter assembly.

OK

8

Check STA fuse.



- (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

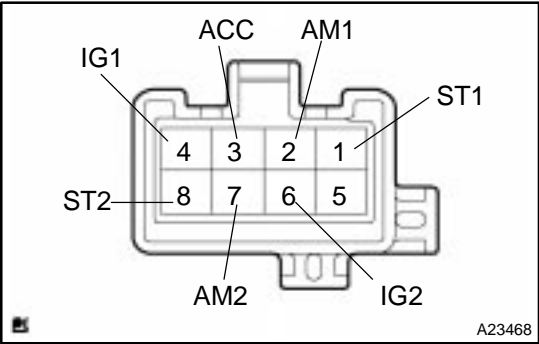
NG

Check for short in all harness and components connected to STA fuse, and replace fuse.

OK

9

Check ignition switch.



- (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 switch.

OK

Check and repair harness and connector.