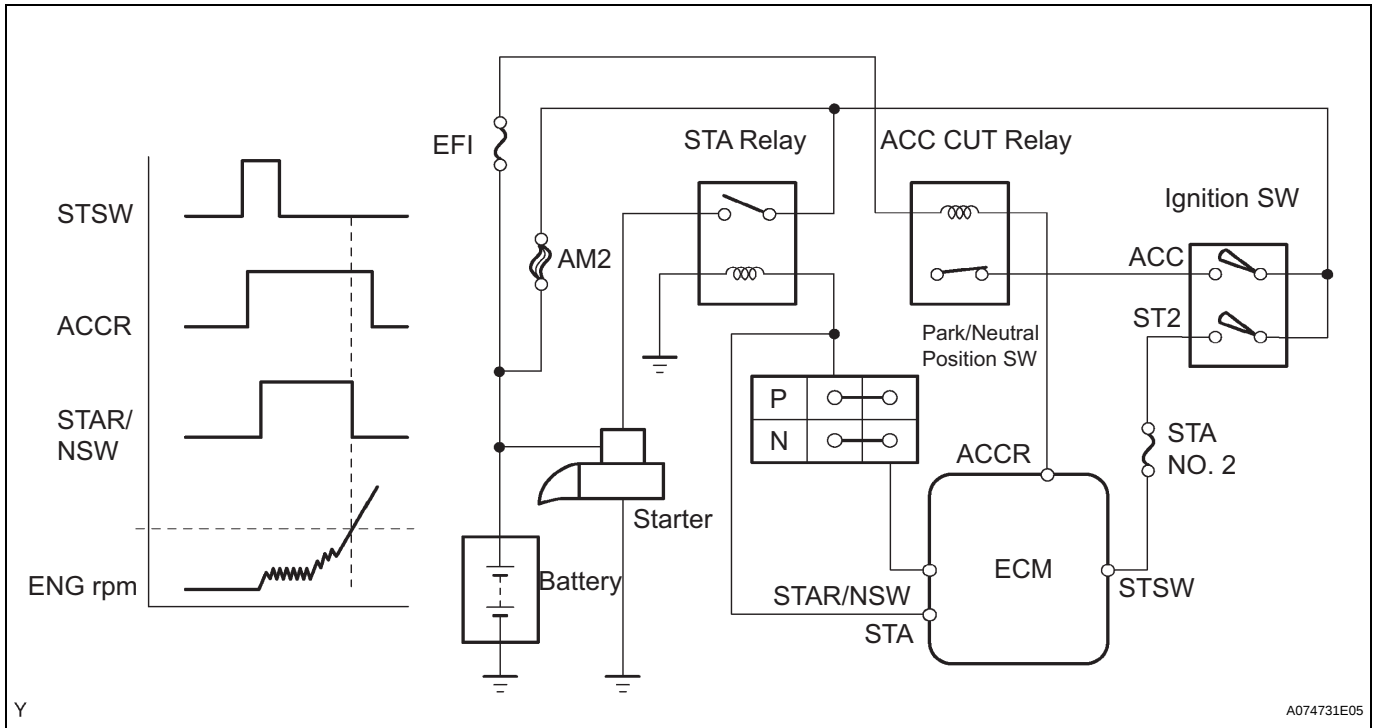


Cranking Holding Function Circuit

DESCRIPTION

The starter is controlled by the ECM, when the ECM detects a start signal (STSW) from the ignition switch, this system monitors the engine speed (NE) and continues to operate the starter until it has determined that the engine has started (engine speed reaches approximately 500 rpm). If the engine is already running and the ignition switch is turned to START, the ECM will not operate the starter.



WIRING DIAGRAM

Refer to DTC P0617 (See page [ES-265](#)).

INSPECTION PROCEDURE

1 CHECK OPERATION OF ENGINE CRANKING

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

OK

CHECK FOR INTERMITTENT PROBLEMS

NG

2 READ VALUE OF INTELLIGENT TESTER (STA SIGNAL)

- (a) Connect the intelligent tester to the DLC3.
 (b) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / ALL / STARTER SIG.
 (c) Read the values.

Standard

STARTER SIG	Ignition Switch Position
OFF	ON
ON	START

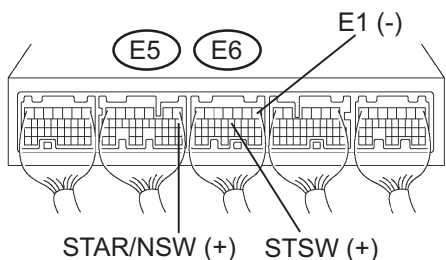
OK

Go to step 5

NG

3 INSPECT ECM (STAR AND STSW VOLTAGE)

ECM:



A131509E61

- (a) Measure the voltage between the terminals of the E5 and E6 ECM connectors, while cranking the engine.

Standard voltage

Tester Connection	Specified Condition
STAR/NSW (E5-8) - E1 (E6-1)	9 to 14 V
STSW (E5-12) - E1 (E6-1)	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

C

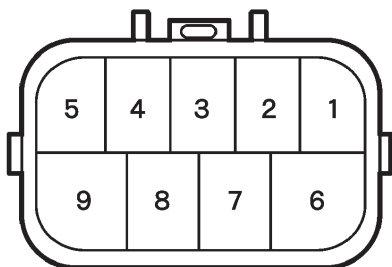
Go to step 9

A

4 INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY

Component Side

(P1) Park/Neutral Position Switch



A137885E01

- (a) Disconnect the P1 park/neutral position switch connector.
 (b) Check for continuity between each terminal shown below when the shift lever is moved to each position.

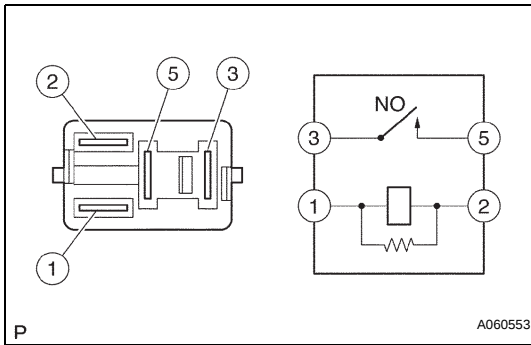
Standard

Shift Position	Tester Connection	Specified Condition
P	1 - 3 6 - 9	Continuity
R	2 - 3	
N	3 - 5 6 - 9	
D	3 - 7	
3	3 - 4	
2, L	3 - 8	

NG

REPLACE PARK/NEUTRAL POSITION SWITCH ASSEMBLY

OK

CHECK AND REPLACE 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

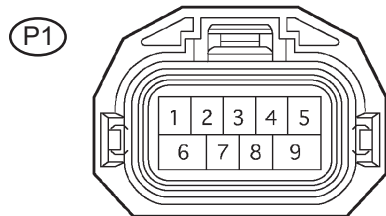
Tester Connection	Specified Condition
1 - 2	Continuity
3 - 5	No continuity
	Continuity (Apply battery voltage to terminals 1 and 2)

- (c) Reinstall the starter relay.

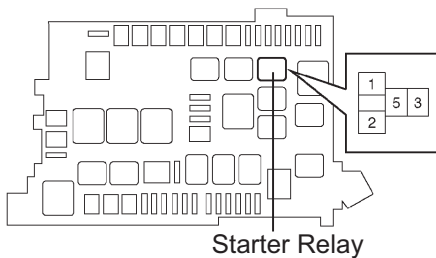
NG

REPLACE STARTER RELAY

OK

6 CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - BODY GROUND)**Wire Harness Side:**

Park/Neutral Position Switch Connector
 Engine Room R/B:



- (a) Check the harness and connector between the park/neutral position switch and starter relay.
 (1) Disconnect the P1 park/neutral position switch connector.
 (2) Remove the starter relay from the engine room R/B.
 (3) Measure the resistance between the wire harness side connectors.

Standard resistance (Check for open)

Tester Connections	Specified Conditions
Park/neutral position switch (P1-6) - Starter relay (1)	Below 1 Ω

Standard resistance (Check for short)

Tester Connections	Specified Conditions
Park/neutral position switch (P1-6) or Starter relay (1) - Body ground	10 k Ω or higher

- (4) Reconnect the park/neutral position switch connector.
 (5) Reinstall the starter relay.
 (b) Check the harness and connector between the starter relay, and body ground.
 (1) Measure the resistance between each relay and body ground.

Standard resistance (Check for open)

Tester Connections	Specified Conditions
Starter relay (2) - Body ground	Below 1 Ω

ES

(2) Reinstall the starter relay.

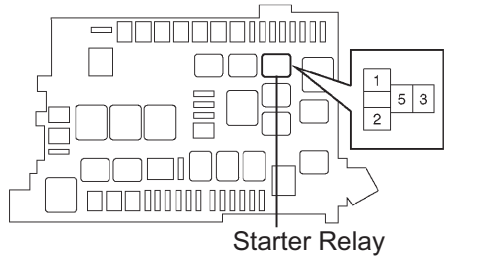
NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

7 INSPECT ENGINE ROOM RELAY BLOCK (STARTER RELAY VOLTAGE)

Engine Room R/B:



- (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 body ground.

Standard voltage

Tester Connections	Specified Conditions
Starter relay (5) - Body ground	9 to 14 V

- (c) Reinstall the starter relay.

NG

CHECK AND REPLACE HARNESS AND CONNECTOR (STARTER RELAY - BATTERY)

OK

8 INSPECT STARTER ASSEMBLY

- (a) Inspect the starter assembly (See page [ST-13](#) for Standard, [ST-30](#) for Cold area).

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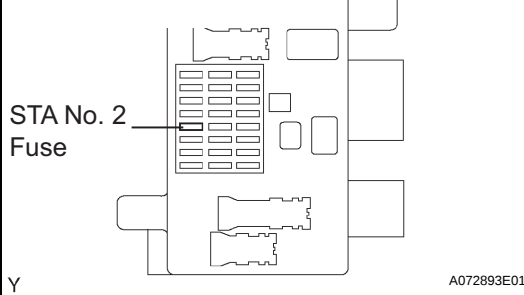
REPAIR OR REPLACE STARTER ASSEMBLY

OK

CHECK AND REPLACE HARNESS AND CONNECTOR (STARTER RELAY - STARTER, STARTER - BATTERY)

9 CHECK FUSE (STA NO. 2)

Driver Side J/B:



- (a) Remove the STA No. 2 fuse from the driver side J/B.
- (b) Check for continuity in the STA No. 2 fuse.

Standard:

Continuity

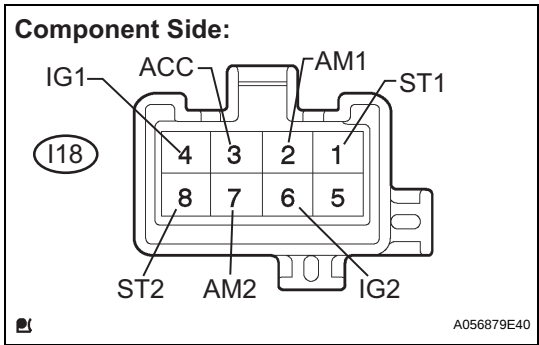
- (c) Reinstall the STA No. 2 fuse.

NG

CHECK FOR SHORT IN ALL HARNESSES AND CONNECTORS CONNECTED NO. 2 STA FUSE AND REPLACE NO. 2 STA FUSE

OK

10 INSPECT IGNITION OR STARTER SWITCH ASSEMBLY



- (a) Disconnect the I18 ignition switch connector.
(b) Check for continuity between the terminals shown in the chart below.

Standard

Switch Position	Tester Connection	Specified Condition
LOCK	All terminal to terminal	No continuity
ACC	2 - 3	Continuity
ON	2 - 3, 2 - 4, 3 - 4, 6 - 7	Continuity
START	1 - 2, 1 - 4, 2 - 4, 6 - 7, 6 - 8, 7 - 8	Continuity

- (c) Reconnect the ignition switch connector.

NG

REPLACE IGNITION OR STARTER SWITCH ASSEMBLY

OK

CHECK AND REPLACE HARNESS AND CONNECTOR (ECM-BATTERT)