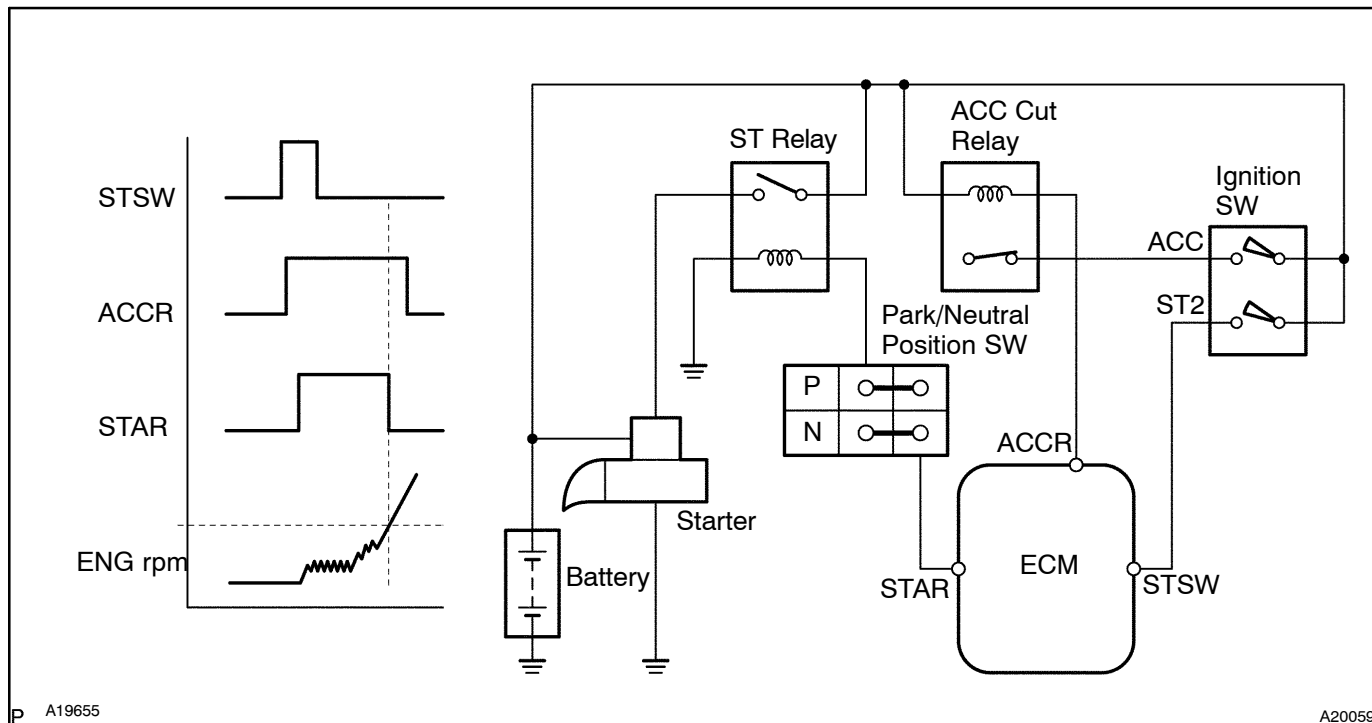


## Cranking Hold Function Circuit

### CIRCUIT DESCRIPTION

When the ECM detects a start signal from the ignition switch, this system monitors the engine rpm and continues to operate the starter until it has determined that the engine has started (engine speed reaches approximately 500 rpm). Furthermore, even if the ECM detects a start signal from the ignition switch, it will not operate the starter if it has determined that the engine has already started.



P A19655

A20059

### WIRING DIAGRAM

Refer to DTC P0617 on page [DI-202](#).

### INSPECTION PROCEDURE

#### Hand-held tester:

|   |                                     |
|---|-------------------------------------|
| 1 | Check operation of engine cranking. |
|---|-------------------------------------|

#### CHECK:

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

#### OK:

Starter motor starts.

OK

Check for intermittent problems (See page [DI-3](#))

NG

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

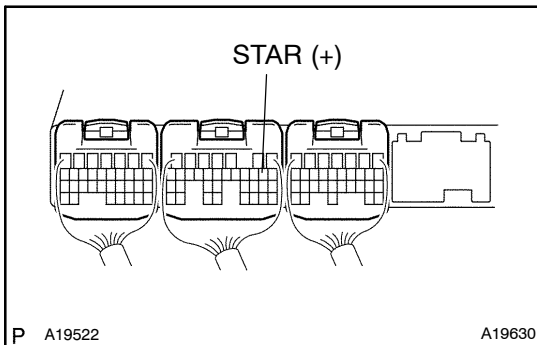
- (a) Connect the hand-held tester to the DLC3.
- (b) Turn the ignition switch ON, and push the hand-held tester main switch ON.

**CHECK:**

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

**OK:**

|                          |     |       |
|--------------------------|-----|-------|
| Ignition Switch Position | ON  | START |
| STA Signal               | OFF | ON    |

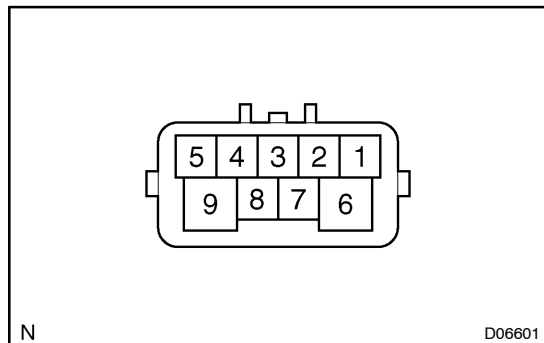
**NG****Go to step 7.****OK****3****Check voltage between terminal STAR of ECM connector and body ground.****PREPARATION:**

- (a) Remove the glove compartment door (See page [SF-60](#)).
- (b) Turn the ignition switch ON.

**CHECK:**

Measure the voltage between terminal STAR of the ECM connector and the body ground, while cranking the engine (ignition switch START position) and while not engine cranking the engine (ignition switch position ON).

**OK:****Voltage: 9 – 14 V****NG****Check and replace ECM (See page [IN-36](#)).****OK**

**4 Check park/neutral position switch.****PREPARATION:**

Remove the park/neutral position switch connector.

**CHECK:**

Check continuity between each terminal shown below when the shift lever is moved to each range.

| Shift range | Terminal No. to continuity |       |
|-------------|----------------------------|-------|
| P           | 1 – 3                      | 6 – 9 |
| R           | 2 – 3                      | –     |
| N           | 3 – 5                      | 6 – 9 |
| D           | 3 – 7                      | –     |
| 2           | 3 – 4                      | –     |
| L           | 3 – 8                      | –     |

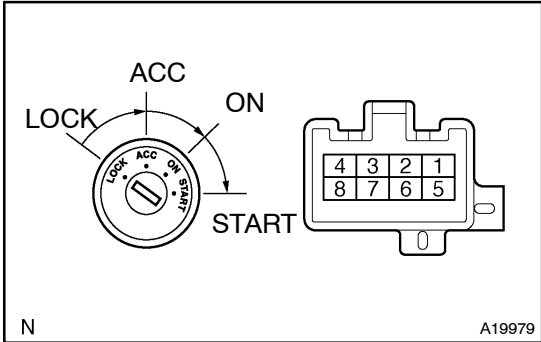
**OK:**

There is continuity.

**NG****Replace the park/neutral position switch.****OK****5 Check starter relay (See page [ST-18](#)).****NG****Replace starter relay.****OK****6 Check for open and short in harness and connector between ECM and park/neutral position switch, park/neutral position switch and starter relay, starter relay and body ground (See page [IN-36](#)).****NG****Repair or replace harness or connector.****OK**

Check for intermittent problems (See page [DI-3](#)).

# 7 Check ignition switch.



## **PREPARATION:**

- (a) Remove the lower finish panel.
- (b) Disconnect the ignition switch connector.

## **CHECK:**

Check continuity between terminals shown below.

## **OK:**

| Switch Position | Terminal No. to continuity |       |
|-----------------|----------------------------|-------|
| LOCK            | -                          | -     |
| ACC             | 2-3                        | -     |
| ON              | 2-3-4                      | 6-7   |
| START           | 1-2-4                      | 6-7-8 |

NG

Replace ignition switch.

OK

# 8 Check for open in harness and connector between terminal STSW of ECM connector and ignition switch (See page [IN-36](#)).

NG

Repair or replace harness or connector.

OK

Check for intermittent problems (See page [DI-3](#)).

**OBD II scan tool (excluding hand-held tester):**

|   |                                     |
|---|-------------------------------------|
| 1 | Check operation of engine cranking. |
|---|-------------------------------------|

**CHECK:**

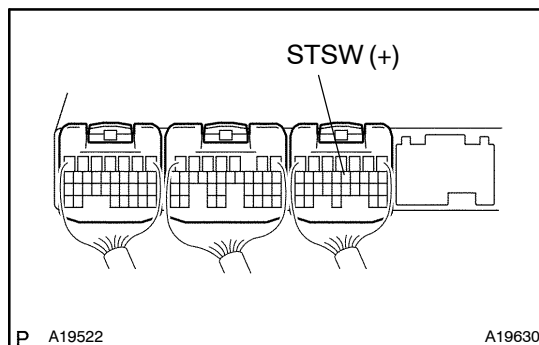
When turning the ignition switch to the ST position, check whether the starter motor starts.

**OK**

Check for intermittent problems (See page [DI-3](#)).

**NG**

|   |                                                                       |
|---|-----------------------------------------------------------------------|
| 2 | Check voltage between terminal STSW of ECM connector and body ground. |
|---|-----------------------------------------------------------------------|

**PREPARATION:**

- (a) Remove the glove compartment door (See page [SF-60](#)).
- (b) Turn the ignition switch ON.

**CHECK:**

Measure the voltage between terminal STSW of the ECM connector and the body ground, while cranking the engine (ignition switch START position) and while not engine cranking the engine (ignition switch position ON).

**OK:**

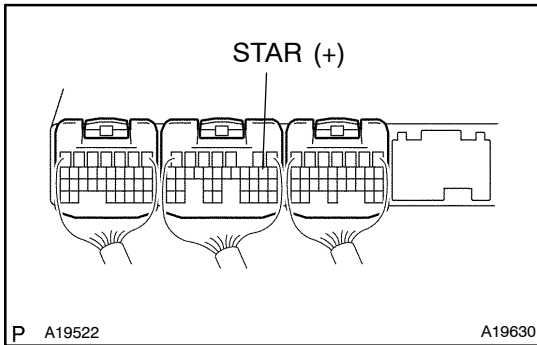
**Voltage: 6 V or more**

**NG**

Go to step 7.

**OK**

### 3 Check voltage between terminal STAR of ECM connector and body ground.



#### **PREPARATION:**

- Remove the glove compartment door (See page [SF-60](#)).
- Turn the ignition switch ON.

#### **CHECK:**

Measure the voltage between terminal STAR of the ECM connector and the body ground, while cranking the engine (ignition switch START position) and while not engine cranking the engine (ignition switch position ON).

#### **OK:**

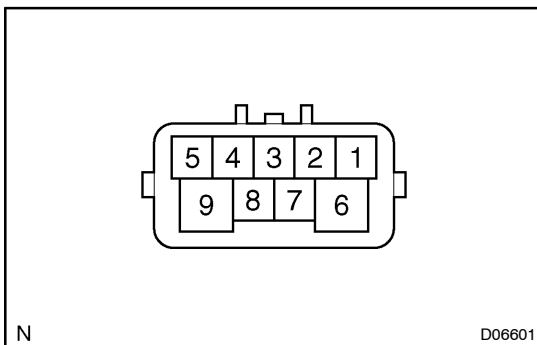
**Voltage: 9 – 14 V**

**NG**

**Check and replace ECM (See page [IN-36](#)).**

**OK**

### 4 Check park/neutral position switch.



#### **PREPARATION:**

Remove the park/neutral position switch connector.

#### **CHECK:**

Check continuity between each terminal shown below when the shift lever is moved to each range.

| Shift range | Terminal No. to continuity |       |
|-------------|----------------------------|-------|
| P           | 1 – 3                      | 6 – 9 |
| R           | 2 – 3                      | –     |
| N           | 3 – 5                      | 6 – 9 |
| D           | 3 – 7                      | –     |
| 2           | 3 – 4                      | –     |
| L           | 3 – 8                      | –     |

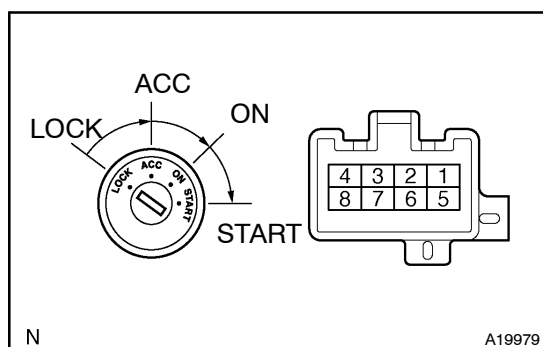
#### **OK:**

**There is continuity.**

**NG**

**Replace the park/neutral position switch.**

**OK**

**5 Check starter relay (See page [ST-18](#)).****NG****Replace starter relay.****OK****6 Check for open and short in harness and connector between ECM and park/neutral position switch, park/neutral position switch and starter relay, starter relay and body ground (See page [IN-36](#)).****NG****Repair or replace harness or connector.****OK****Check for intermittent problems (See page [DI-3](#)).****7 Check ignition switch.****PREPARATION:**

- (a) Remove the lower finish panel.
- (b) Disconnect the ignition switch connector.

**CHECK:**

Check continuity between terminals shown below.

**OK:**

| Switch Position | Terminal No. to continuity |       |
|-----------------|----------------------------|-------|
| LOCK            | -                          | -     |
| ACC             | 2-3                        | -     |
| ON              | 2-3-4                      | 6-7   |
| START           | 1-2-4                      | 6-7-8 |

**NG****Replace ignition switch.****OK**

|   |                                                                                                                                    |
|---|------------------------------------------------------------------------------------------------------------------------------------|
| 8 | Check for open in harness and connector between terminal STSW of ECM connector, ignition switch (See page <a href="#">IN-36</a> ). |
|---|------------------------------------------------------------------------------------------------------------------------------------|

NG

Repair or replace harness or connector.

OK

Check for intermittent problems (See page [DI-3](#)).