| DTC | B2412 | HEADLIGHT SWIVEL MOTOR LH MALFUNCTION |
|-----|-------|---------------------------------------|

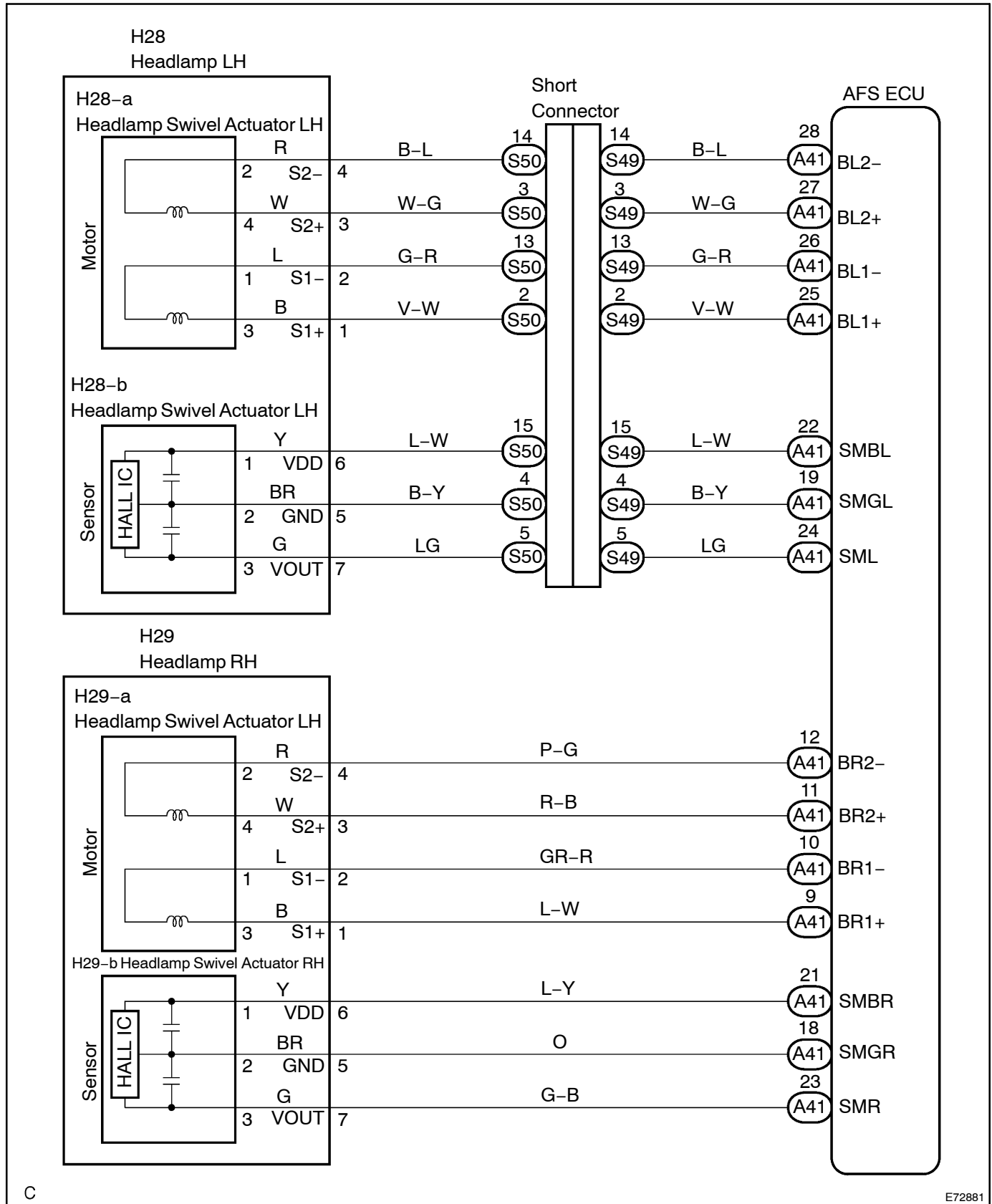| DTC | B2413 | HEADLIGHT SWIVEL MOTOR RH MALFUNCTION |
|-----|-------|---------------------------------------|

## CIRCUIT DESCRIPTION

The swivel motor the receives the signal from the AFS ECU to operate and sends the signal regarding the direction of the headlamp and the condition of the headlamp swivel motor to the AFS ECU.

| DTC No. | DTC Detecting Condition | Trouble Area |
|---------|-------------------------|--------------|
| B2412 | • Malfunction in headlamp swivel actuator LH<br>• Open or short in headlamp swivel actuator LH circuit<br>• Open or short in headlamp swivel actuator position sensor LH | • Headlamp swivel motor LH<br>• Wire harness or connector<br>• AFS ECU |
| B2413 | • Malfunction in headlamp swivel actuator RH<br>• Open or short in headlamp swivel actuator RH circuit<br>• Open or short in headlamp swivel actuator position sensor RH | • Headlamp swivel motor RH<br>• Wire harness or connector<br>• AFS ECU |

# WIRING DIAGRAM

H28
Headlamp LH

H28–a
Headlamp Swivel Actuator LH

Short Connector

AFS ECU

Motor

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R | | B–L | 14 S50 | 14 S49 | B–L | 28 A41 | BL2– |
| 2 S2– 4 | | | | | | | |
| W | | W–G | 3 S50 | 3 S49 | W–G | 27 A41 | BL2+ |
| 4 S2+ 3 | | | | | | | |
| L | | G–R | 13 S50 | 13 S49 | G–R | 26 A41 | BL1– |
| 1 S1– 2 | | | | | | | |
| B | | V–W | 2 S50 | 2 S49 | V–W | 25 A41 | BL1+ |
| 3 S1+ 1 | | | | | | | |

H28–b
Headlamp Swivel Actuator LH

Sensor   HALL IC

| | | | | | | |
|---|---|---|---|---|---|---|
| Y | L–W | 15 S50 | 15 S49 | L–W | 22 A41 | SMBL |
| 1 VDD 6 | | | | | | |
| BR | B–Y | 4 S50 | 4 S49 | B–Y | 19 A41 | SMGL |
| 2 GND 5 | | | | | | |
| G | LG | 5 S50 | 5 S49 | LG | 24 A41 | SML |
| 3 VOUT 7 | | | | | | |

H29
Headlamp RH

H29–a
Headlamp Swivel Actuator LH

Motor

| | | | |
|---|---|---|---|
| R | P–G | 12 A41 | BR2– |
| 2 S2– 4 | | | |
| W | R–B | 11 A41 | BR2+ |
| 4 S2+ 3 | | | |
| L | GR–R | 10 A41 | BR1– |
| 1 S1– 2 | | | |
| B | L–W | 9 A41 | BR1+ |
| 3 S1+ 1 | | | |

H29–b Headlamp Swivel Actuator RH

Sensor   HALL IC

| | | | |
|---|---|---|---|
| Y | L–Y | 21 A41 | SMBR |
| 1 VDD 6 | | | |
| BR | O | 18 A41 | SMGR |
| 2 GND 5 | | | |
| G | G–B | 23 A41 | SMR |
| 3 VOUT 7 | | | |

C

E72881

# INSPECTION PROCEDURE

HINT:

For vehicles without an electronic modulated air suspension: If there is a malfunction in the power source circuit inside the AFS ECU, DTC B2416 is also output. In this case, troubleshoot B2412/B2413 and then B2416 before replacing the AFS ECU.

| 1 | PERFORM ACTIVE TEST ON INTELLIGENT TESTER II |
|---|---|

(a)   Connect the intelligent tester II to the DLC3.

(b)   Turn the ignition switch to the ON position and turn the intelligent tester II main switch on.

(c)   Select the item below in the ACTIVE TEST and then check that the motor operates.

**AFS (AFS ECU):**

| Item | Test Details | Diagnostic Note |
|---|---|---|
| Drive Swivel Motor RH | Drive the swivel motor RIGHT/OFF | – |
| Drive Swivel Motor LH | Drive the swivel motor LEFT/OFF | – |

**OK: Swivel actuator operates.**

**Result:**

| | |
|---|---|
| OK (When checking from the PROBLEM SYMPTOMS TABLE) | A |
| OK (When checking from the DIAGNOSTIC TROUBLE CODE CHART) | B |
| NG | C |

| B | REPLACE AFS ECU (SEE PAGE 65−28 OR 65−29) |
|---|---|

| C | Go to step 2 |
|---|---|

| A |
|---|

| PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05−1369) |
|---|

| 2 | INSPECT HEADLAMP ASSY |
|---|---|

**Connector Front View:**

(H28)  Headlamp LH
(H29)  Headlamp RH

```
        ┌──┐
      ┌─┴──┴─┐
    ┌─┤ 2 │ 1 ├─┐
    │ │5│ 4 │3│ │
    └─┤ 7 │ 6 ├─┘
      └─┬──┬─┘
        └──┘
```

E72606                    I37563

(a)  Disconnect the headlamp assy connector on the swivel motor side.

(b)  Measure the resistance according to the value(s) in the table below.

**Standard:**

**LH Side (B2412):**

| Tester Connection | Condition | Specified Condition |
|---|---|---|
| H28–1 – H28–2 | Always | 6 to 8 Ω |
| H28–3 – H28–4 | Always | 6 to 8 Ω |

**RH Side (B2413):**

| Tester Connection | Condition | Specified Condition |
|---|---|---|
| H29–1 – H29–2 | Always | 6 to 8 Ω |
| H29–3 – H29–4 | Always | 6 to 8 Ω |

HINT:

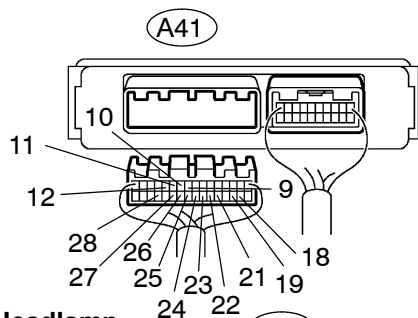Measure the resistance after the headlamp has cooled.

| NG | REPLACE HEADLAMP ASSY (SEE PAGE 65–9) |
|---|---|

**OK**

## 3 | CHECK HARNESS AND CONNECTOR(AFS ECU – HEADLAMP)

**AFS ECU**
**Connector Front View:**

(A41)

10
11
12
9
28
26
18
27
25
23
21
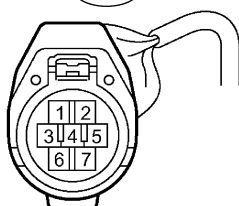19
24
22

**Headlamp**
**Wire Harness View:**
(H28) Headlamp LH
(H29) Headlamp RH

1 2
3 4 5
6 7

H                                                I37547

(a) Disconnect the A41 connector from the AFS ECU and headlamp assy connector on the swivel motor side.

(b) Measure the resistance according to the value(s) in the table below.

**Standard:**
**LH Side (B2412):**

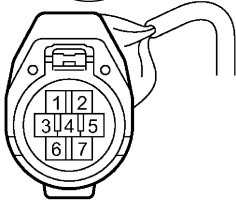| Tester Connection | Condition | Specified Condition |
|---|---|---|
| A41–19 – H28–5 | Always | Below 1 Ω |
| A41–22 – H28–6 | Always | Below 1 Ω |
| A41–24 – H28–7 | Always | Below 1 Ω |
| A41–25 – H28–1 | Always | Below 1 Ω |
| A41–26 – H28–2 | Always | Below 1 Ω |
| A41–27 – H28–3 | Always | Below 1 Ω |
| A41–28 – H28–4 | Always | Below 1 Ω |
| A41–19 – Body ground | Always | 10 kΩ or higher |
| A41–22 – Body ground | Always | 10 kΩ or higher |
| A41–24 – Body ground | Always | 10 kΩ or higher |
| A41–25 – Body ground | Always | 10 kΩ or higher |
| A41–26 – Body ground | Always | 10 kΩ or higher |
| A41–27 – Body ground | Always | 10 kΩ or higher |
| A41–28 – Body ground | Always | 10 kΩ or higher |

## RH Side (B2413):

| Tester Connection | Condition | Specified Condition |
|---|---|---|
| A41–9 – H29–1 | Always | Below 1 Ω |
| A41–10 – H29–2 | Always | Below 1 Ω |
| A41–11 – H29–3 | Always | Below 1 Ω |
| A41–12 – H29–4 | Always | Below 1 Ω |
| A41–18 – H29–5 | Always | Below 1 Ω |
| A41–21 – H29–6 | Always | Below 1 Ω |
| A41–23 – H29–7 | Always | Below 1 Ω |
| A41–9 – Body ground | Always | 10 kΩ or higher |
| A41–10 – Body ground | Always | 10 kΩ or higher |
| A41–11 – Body ground | Always | 10 kΩ or higher |
| A41–12 – Body ground | Always | 10 kΩ or higher |
| A41–18 – Body ground | Always | 10 kΩ or higher |
| A41–21 – Body ground | Always | 10 kΩ or higher |
| A41–23 – Body ground | Always | 10 kΩ or higher |

NG ⟩ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

| 4 | INSPECT AFS ECU |

**Wire Harness View:** (H28) Headlamp LH
(H29) Headlamp RH

I37549

(a) Disconnect the headlamp assy connector on the swivel motor side.

(b) Measure the voltage according to the value(s) in the table below.

**Standard:**

**LH Side (B2412):**

| Tester Connection | Condition | Specified Condition |
|---|---|---|
| H28–5 – H28–6 | Ignition switch OFF ⇒ ON | Below 1 V → 4.5 to 5.5 V |

**RH Side (B2413):**

| Tester Connection | Condition | Specified Condition |
|---|---|---|
| H29–5 – H29–6 | Ignition switch OFF ⇒ ON | Below 1 V → 4.5 to 5.5 V |

**Result:**

| | |
|---|---|
| OK | A |
| NG (When checking from the PROBLEM SYMPTOMS TABLE) | B |
| NG (When checking from the DIAGNOSTIC TROUBLE CODE CHART) | C |

> **B** PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (**SEE PAGE 05–1369**)

> **C** REPLACE AFS ECU (**SEE PAGE 65–28 OR 65–29**)

∨ **A**

| 5 | REPLACE HEADLAMP ASSY (**SEE PAGE 65–9**) |

**OK: Return to normal operation.**

> **NG** REPLACE AFS ECU (**SEE PAGE 65–28 OR 65–29**)

∨ **OK**

| END |