

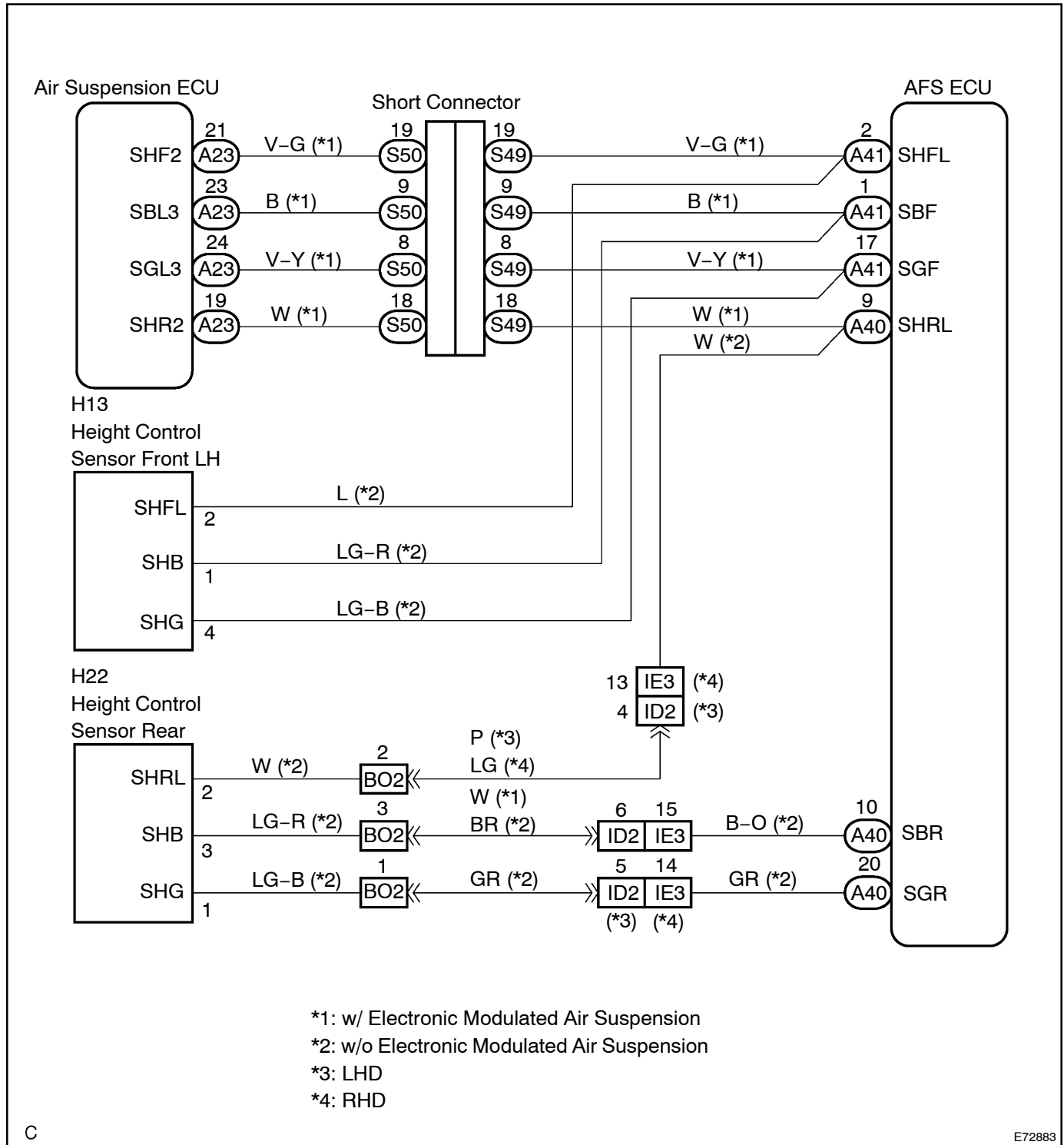
DTC	B2416	HEIGHT CONTROL SENSOR MALFUNCTION
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CIRCUIT DESCRIPTION

The AFS ECU receives signals regarding the height of the front/rear of the vehicle from the suspension control ECU. If the vehicle doesn't have a suspension control ECU, the AFS ECU also has height control sensors.

DTC No.	DTC Detecting Condition	Trouble Area
B2416	• Malfunction in height control ECU • Open or short in vehicle height sensor circuit	• Suspension control ECU (w/ Air suspension) • Height control sensor (w/o Air suspension) • Wire harness or connector • AFS ECU

WIRING DIAGRAM



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 B2412/B2413 are also output. In this case, troubleshoot B2416 and then the B2412 before replacing the AFS ECU.

1 READ VALUE OF INTELLIGENT TESTER

- (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 items below in the DATA LIST, and read the displays on the Intelligent Tester II.

AFS (AFS ECU):

Item	Measurement Item/ Display (Range)	Normal Condition	Diagnostic Note
Fr Height Sens Signal Val	Front Height Sensor signal value/ 0 to 5 V	Approx. 2.5 V	-
Rr Height Sens Signal Val	Rear Height Sensor signal value/ 0 to 5 V	Approx. 2.5 V	-

OK: Condition sign can be displayed.

Result:

OK (When checking from the PROBLEM SYMPTOMS TABLE)	A
OK (When checking from the DIAGNOSTICS 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 CHECK VEHICLE CONDITION

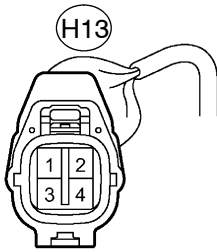
- (a) Check the vehicle condition.

Standard:

w/o Air Suspension System	A
w/ Air Suspension System	B

B Go to step 11

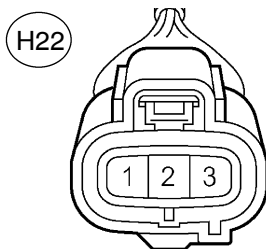
A

3 CHECK HARNESS AND CONNECTOR(FRONT HEIGHT SENSOR CIRCUIT)**Height Control Sensor Front
Wire Harness View:**

- (a) Disconnect the H13 connector from the height control sensor front LH.
- (b) Measure the voltage according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
H13-1 - H13-4	Ignition switch ON	4.5 to 5.5 V

NG**Go to step 9****OK****4 CHECK HARNESS AND CONNECTOR(REAR HEIGHT SENSOR CIRCUIT)****Height Control Sensor Front
Wire Harness View:**

- (a) Disconnect the H22 connector from the height control sensor rear LH.
- (b) Measure the voltage according to the value(s) in the table below.

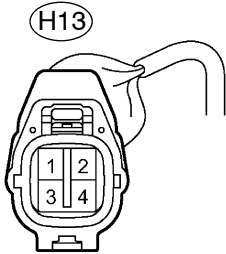
Standard:

Tester Connection	Condition	Specified Condition
H22-1 - H22-3	Ignition switch ON	4.5 to 5.5 V

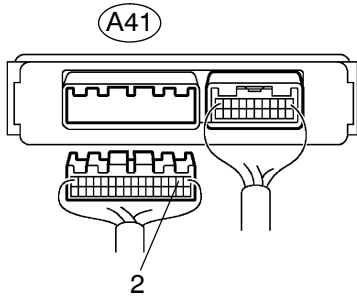
NG**Go to step 10****OK**

5 CHECK HARNESS AND CONNECTOR(AFS ECU - HEIGHT CONTROL SENSOR FRONT)

**Height Control Sensor Front
Wire Harness View:**



**AFS ECU
Connector Front View:**



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- (a) Disconnect the A41 connector from the AFS ECU.
- (b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester Connection	Condition	Specified Condition
A41-2 (SHFL) - H13-2 (SHFL)	Always	Below 1 Ω
A41-2 (SHFL) - Body ground	Always	10 k Ω or higher

NG

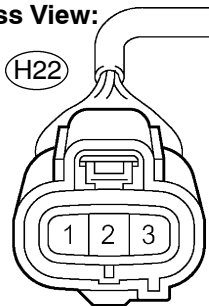
REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

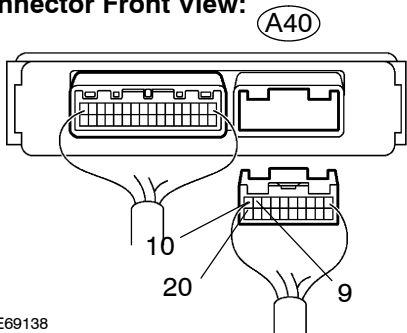
6

CHECK HARNESS AND CONNECTOR(AFS ECU - HEIGHT CONTROL SENSOR REAR)

Height Control Sensor Rear
Wire Harness View:



AFS ECU
Connector Front View:



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E69120

E72781

- (a) Disconnect the A40 connector from AFS ECU.
- (b) Measure the resistance according to the value(s) in the table below.

Standard:

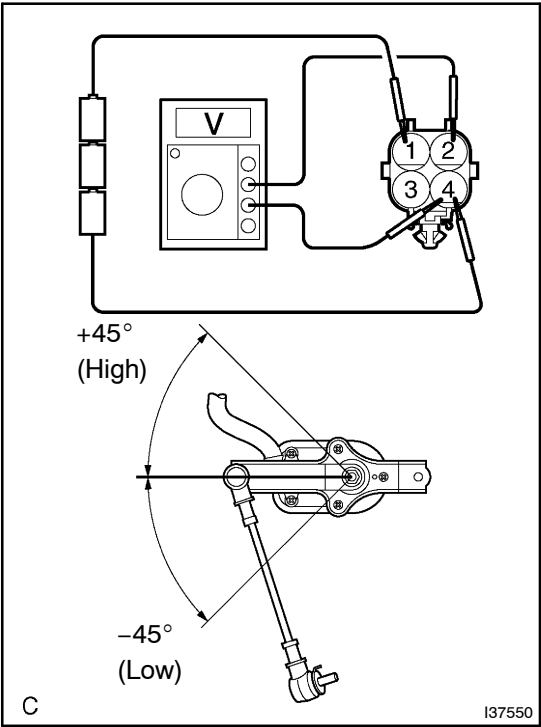
Tester Connection	Condition	Specified Condition
A40-9 (SHRL) - H22-2 (SHRL)	Always	Below 1 Ω
A40-9 (SHRL) - Body ground	Always	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

7 INSPECT HEIGHT CONTROL SENSOR SUB-ASSY FRONT LH



- (a) Connect the 3 dry cell batteries (1.5V) in series.
- (b) Remove the height control sensor sub-assy front.
- (c) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead from the battery to terminal 4.
- (d) Measure the voltage between terminals 2 and 4 while slowly moving the link up and down.

Standard:

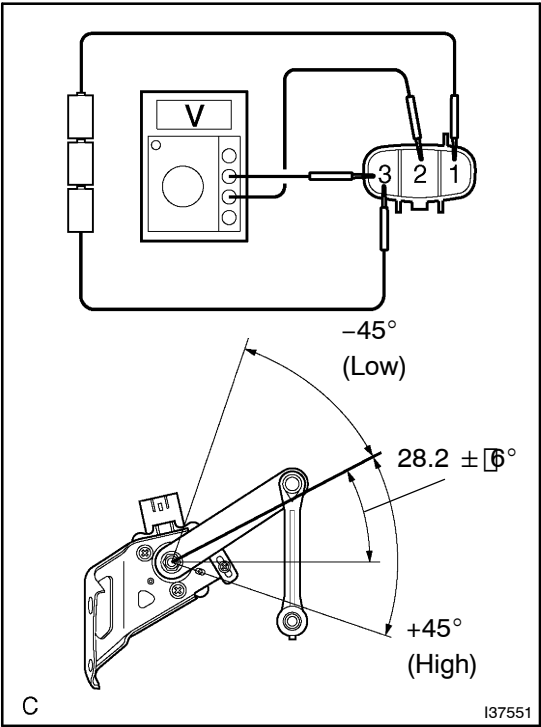
Tester Connection	Link Angle	Specified Condition
H13-2 (SHFL) - H13-4 (SGF)	+45° (High)	Approx. 4.5V
H13-2 (SHFL) - H13-4 (SGF)	0° (Normal)	Approx. 2.5V
H13-2 (SHFL) - H13-4 (SGF)	-45° (Low)	Approx. 0.5V

NG

REPLACE HEIGHT CONTROL SENSOR SUB-ASSY FRONT LH (SEE PAGE 65-26)

OK

8 INSPECT HEIGHT CONTROL SENSOR SUB-ASSY REAR LH



- (a) Connect the 3 dry cell batteries (1.5V) in series.
- (b) Remove the height control sensor sub-assy rear.
- (c) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead from the battery to terminal 3.
- (d) Measure the voltage between terminal 2 and 3 while slowly moving the link up and down.

Standard:

Tester Connection	Link Angle	Specified Condition
H22-2 (SHRL) - H22-3 (SHG)	+45° (High)	Approx. 4.5V
H22-2 (SHRL) - H22-3 (SHG)	0° (Normal)	Approx. 2.5V
H22-2 (SHRL) - H22-3 (SHG)	-45° (Low)	Approx. 0.5V

Result:

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

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

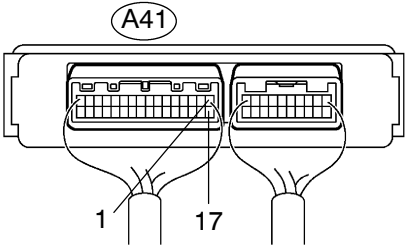
C REPLACE HEIGHT CONTROL SENSOR SUB-ASSY REAR LH (SEE PAGE 65-27)

A

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

9 INSPECT AFS ECU

AFS ECU
Connector Front View:



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

Standard:

Tester connection	Condition	Specified Voltage
A41-1 (SBF) - A41-17 (SGF)	Ignition switch ON	4.5 to 5.5 V

Result:

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

B

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

C

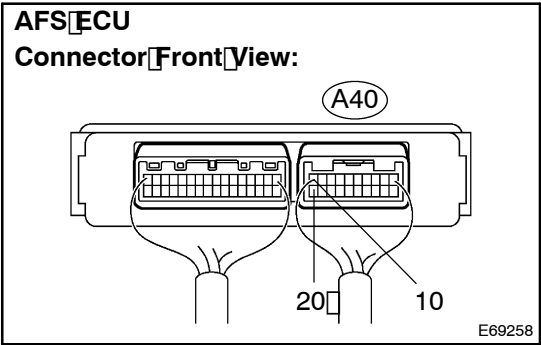
PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05-1369)

A

REPAIR OR REPLACE HARNESS OR CONNECTOR (AFS ECU - HEIGHT CONTROL SENSOR FRONT)

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INSPECT AFS ECU



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

Standard:

Tester Connection	Condition	Specified Voltage
A41-10 (SBR) - A41-20 (SGR)	Ignition switch ON	4.5 to 5.5 V

Result:

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

B

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

C

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

A

REPAIR OR REPLACE HARNESS OR CONNECTOR (AFS ECU - HEIGHT CONTROL SENSOR REAR)

11

CHECK DTC(AIR SUSPENSION SYSTEM)

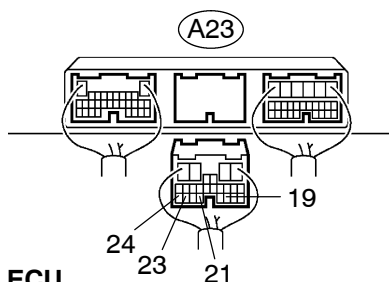
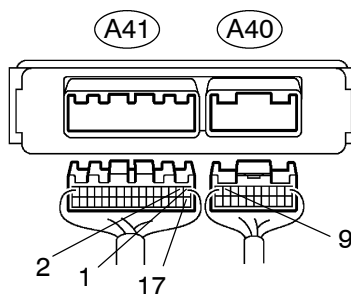
(a) Check for DTCs in the air suspension system (see page 05-248).

OK: Normal system code is output.

NG

GO TO FLOW CHART (SEE PAGE 05-254)

OK

12 CHECK HARNESS AND CONNECTOR(SUSPENSION CONTROL ECU - AFS ECU)**Air Suspension ECU
Connector Front View:****AFS ECU
Connector Front View:**

H

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- (a) Disconnect the suspension control ECU connector and AFS ECU connectors.
- (b) Measure the resistance according to the value(s) in the table below.

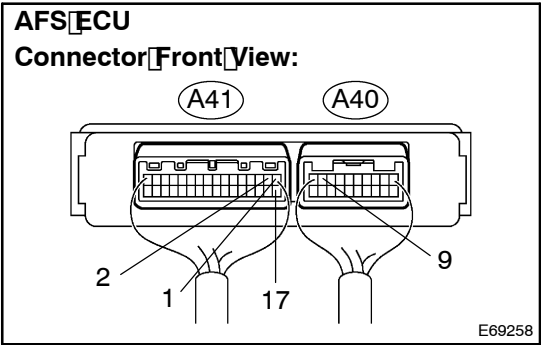
Standard:

Tester connection	Condition	Specified condition
A41-1 (SBF) - A23-23 (SBL3)	Always	Below 1 Ω
A41-2 (SHFL) - A23-21 (SHF2)	Always	Below 1 Ω
A41-17 (SGF) - A23-24 (SGL3)	Always	Below 1 Ω
A40-9 (SHRL) - A23-19 (SHR2)	Always	Below 1 Ω
A41-1 (SBF) - Body ground	Always	10 k Ω or higher
A41-2 (SHFL) - Body ground	Always	10 k Ω or higher
A41-17 (SGF) - Body ground	Always	10 k Ω or higher
A40-9 (SHRL) - Body ground	Always	10 k Ω or higher

NG**REPAIR OR REPLACE HARNESS OR CONNECTOR****OK**

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INSPECT AFS ECU



- (a) Reconnect the suspension control ECU and AFS ECU.
- (b) Measure the voltage according to the value(s) in the table below.

Standard:

Tester connection	Condition	Specified Voltage
A41-1 (SBF) - A41-17 (SGF)	Ignition switch ON	4.5 to 5.5 V
A41-2 (SHFL) - A41-17 (SGF)	Ignition switch ON	0.5 to 4.5 V
A40-9 (SHRL) - A41-17 (SGF)	Ignition switch ON	0.5 to 4.5 V

Result:

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

B

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

C

REPLACE SUSPENSION CONTROL ECU
(SEE PAGE 25-20)

A

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