

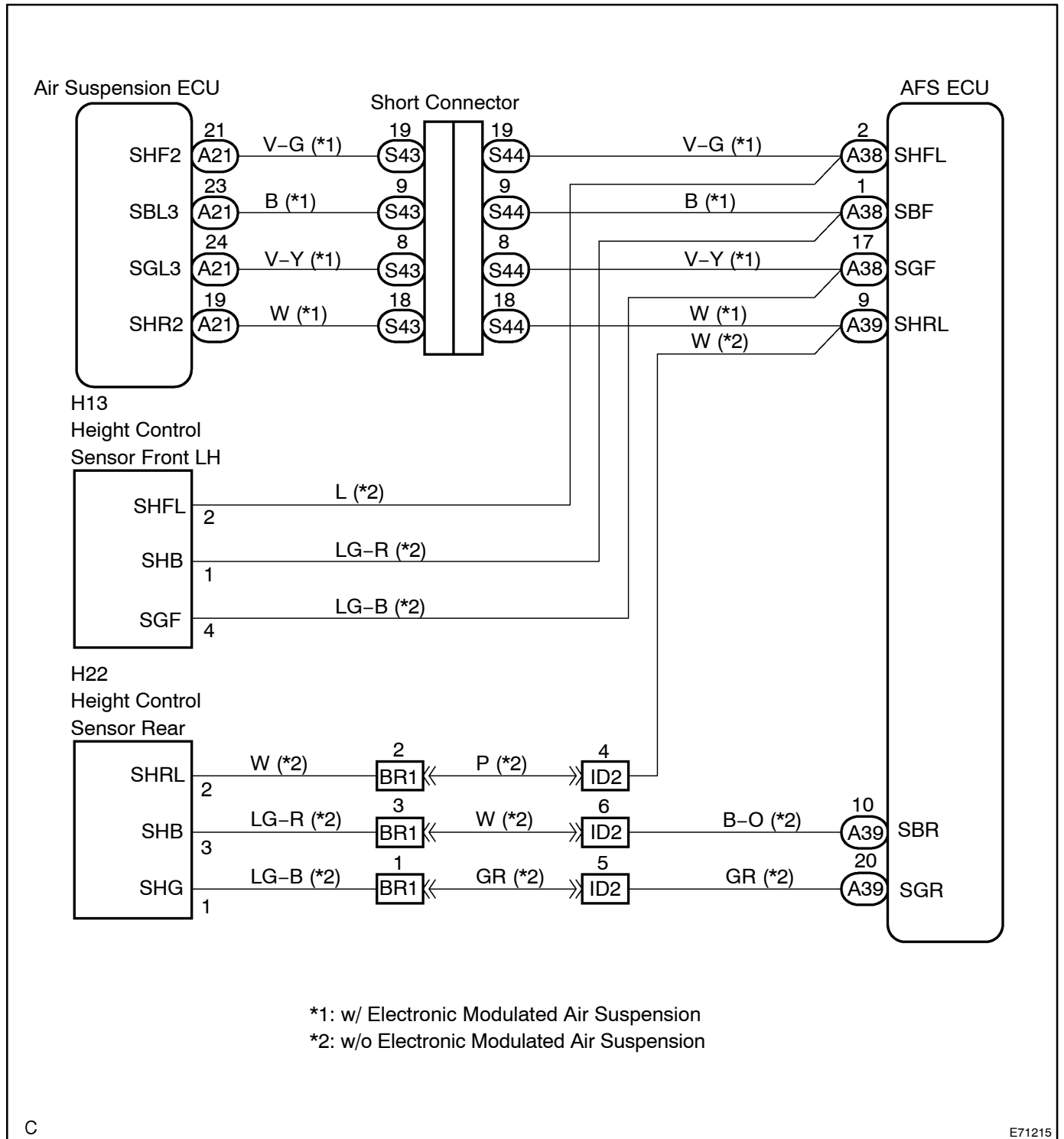
DTC	B2416	HEIGHT CONTROL SENSOR MALFUNCTION
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CIRCUIT DESCRIPTION

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 has also height control sensors.

DTC No.	DTC Detecting Condition	Trouble Area
B2416	<ul style="list-style-type: none">• Malfunction in height control ECU• Open or short in vehicle height sensor circuit	<ul style="list-style-type: none">• Suspension control ECU (w/ Air suspension)• Height control sensor (w/o Air suspension)• Wire harness or connector• AFS ECU

WIRING DIAGRAM



C

E71215

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 HAND-HELD TESTER
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- (a) Connect the hand-held tester to the DLC3.
- (b) Turn the ignition switch to the ON position and turn the hand-held tester main switch on.
- (c) Select the items below in the DATA LIST, and read the displays on the hand-held tester.

AFS (AFS ECU):

Item	Measurement Item/ Display (Range)	Normal condition	Diagnostic Note
FR HEIGHT SENS	Front height sensor signal value/ 0 to 5 V	Approx. 2.5 V	-
RR HEIGHT SENS	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 65-26)**

C **Go to step 2**

A

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05-1476)

2	CHECK VEHICLE CONDITION
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- (a) Check the vehicle condition.

Standard:

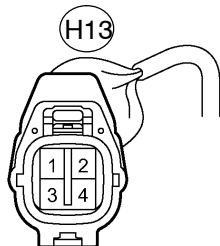
w/o Air Suspension System	A
w/ Air Suspension System	B

B **Go to step 11**

A

3 CHECK HARNESS AND CONNECTOR(FRONT HEIGHT SENSOR CIRCUIT)

Height Control Sensor Front Wire Harness View:



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

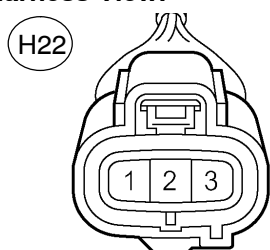
Standard:

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:



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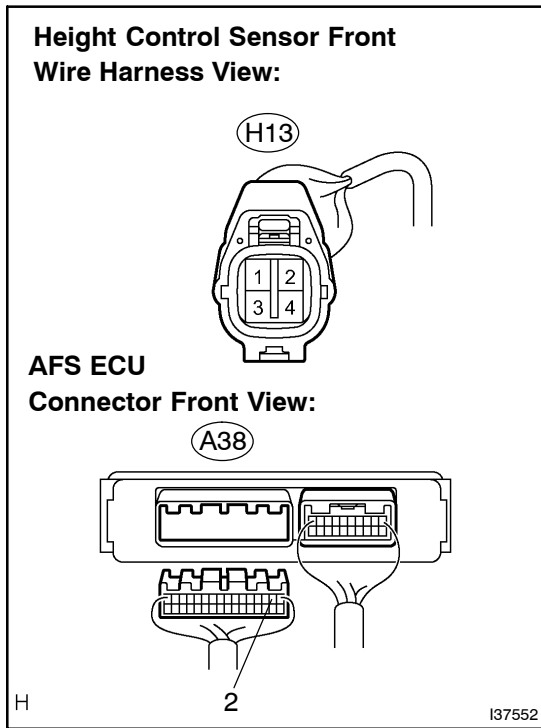
- Disconnect the H22 connector from the height control sensor rear LH.
- Measure the voltage according to the value(s) in the table below.

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)



- (a) Disconnect the A38 connector from the AFS ECU.
- (b) Measure the resistance according to the value(s) in the table below.

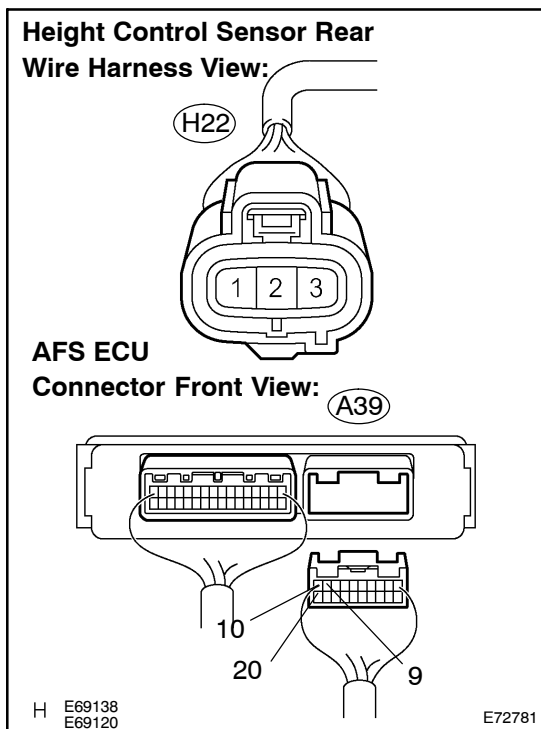
Standard:

Tester Connection	Condition	Specified Condition
A38-2 (SHFL) - H13-2 (SHFL)	Always	Below 1 Ω
A38-2 (SHFL) - Body ground	Always	10 kΩ or higher

NG REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

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



- (a) Disconnect the A39 connector from the AFS ECU.
- (b) Measure the resistance according to the value(s) in the table below.

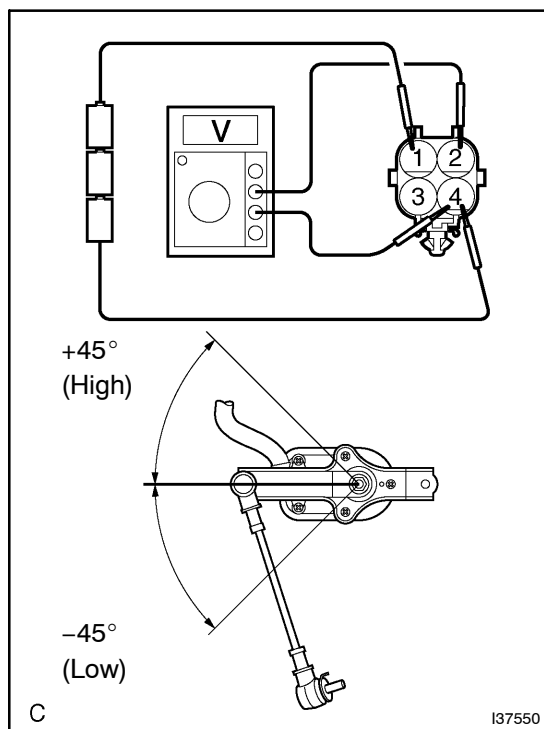
Standard:

Tester Connection	Condition	Specified Condition
A39-9 (SHRL) - H22-2 (SHRL)	Always	Below 1 Ω
A39-9 (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



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

Standard:

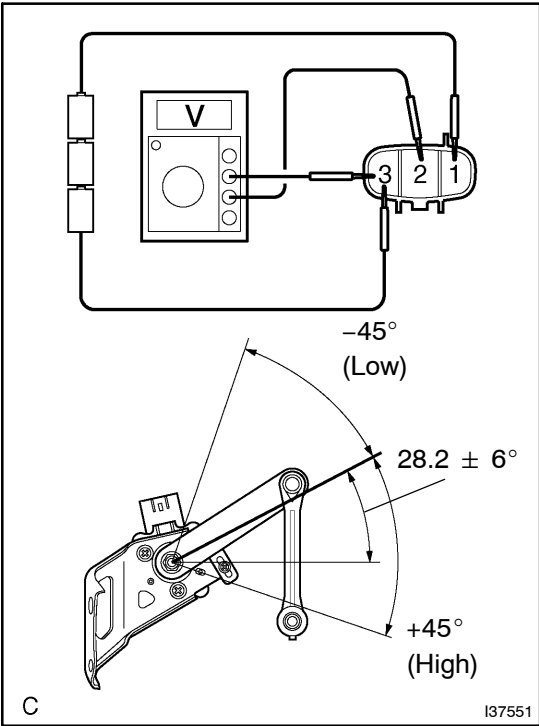
Tester Connection	Link Angle	Specified Condition
H13-2 (SHFL) - H13-4 (SGF)	+45° (High)	Approx. 4.5 V
H13-2 (SHFL) - H13-4 (SGF)	0° (Normal)	Approx. 2.5 V
H13-2 (SHFL) - H13-4 (SGF)	-45° (Low)	Approx. 0.5 V

NG

REPLACE HEIGHT CONTROL SENSOR SUB-ASSY FRONT LH (SEE PAGE 65-24)

OK

8 INSPECT HEIGHT CONTROL SENSOR SUB-ASSY REAR LH



- (a) Connect the 3 dry cell batteries (1.5 V) 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 terminals 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. 4.5 V
H22-2 (SHRL) - H22-3 (SHG)	0° (Normal)	Approx. 2.5 V
H22-2 (SHRL) - H22-3 (SHG)	-45° (Low)	Approx. 0.5 V

Result:

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

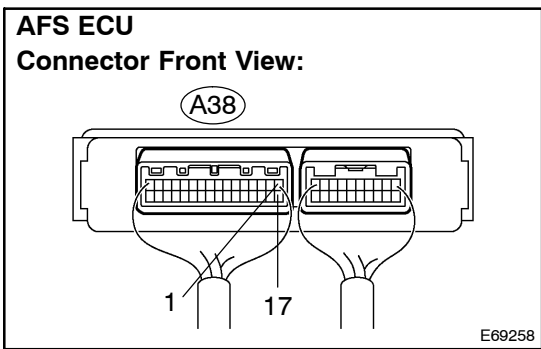
B → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05-1476)

C → REPLACE HEIGHT CONTROL SENSOR SUB-ASSY REAR LH (SEE PAGE 65-25)

A

REPLACE AFS ECU (SEE PAGE 65-26)

9 INSPECT AFS ECU



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

Standard:

Tester connection	Condition	Specified Voltage
A38-1 (SBF) - A38-17 (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

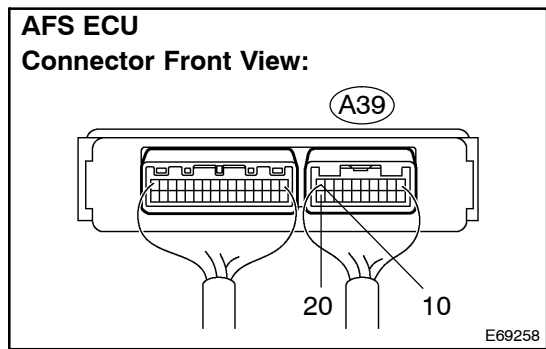
B → REPLACE AFS ECU (SEE PAGE 65-26)

C → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05-1476)

A

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

10 | INSPECT AFS ECU



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

Standard:

Tester connection	Condition	Specified Voltage
A39-10 (SBR) - A39-20 (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 65-26)

C → PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (SEE PAGE 05-1476)

A

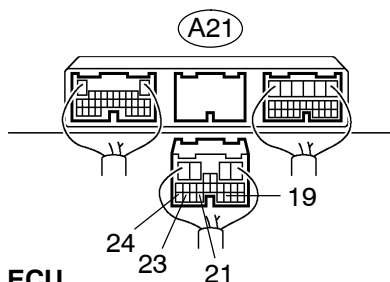
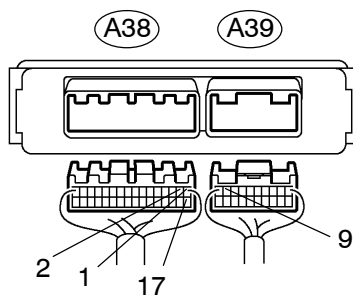
REPAIR OR REPLACE HARNESS OR CONNECTOR (AFS ECU - HEIGHT CONTROL SENSOR REAR)

11 | CHECK DTC(AIR SUSPENSION SYSTEM)

(a) Check for DTCs in the air suspension system (see page 05-349).
OK: Normal system code is output.

NG → GO TO FLOW CHART (SEE PAGE 05-355)

OK

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

**AFS ECU
Connector Front View:**


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

Standard:

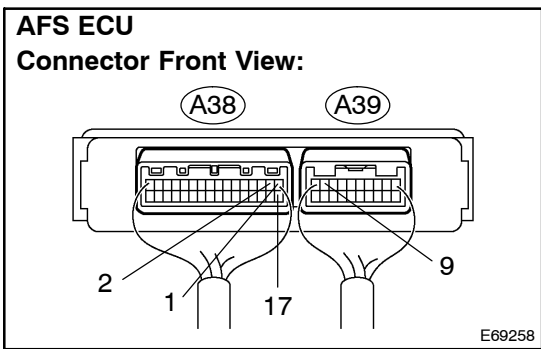
Tester connection	Condition	Specified condition
A38-1 (SBF) - A21-23 (SBL3)	Always	Below 1 Ω
A38-2 (SHFL) - A21-21 (SHF2)	Always	Below 1 Ω
A38-17 (SGF) - A21-24 (SGL3)	Always	Below 1 Ω
A39-9 (SHRL) - A21-19 (SHR2)	Always	Below 1 Ω
A38-1 (SBF) - Body ground	Always	10 k Ω or higher
A38-2 (SHFL) - Body ground	Always	10 k Ω or higher
A38-17 (SGF) - Body ground	Always	Below 1 Ω
A39-9 (SHRL) - Body ground	Always	10 k Ω or higher

NG

**REPAIR OR REPLACE HARNESS OR
CONNECTOR**

OK

13 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
A38-1 (SBF) - A38-17 (SGF)	Ignition switch ON	4.5 to 5.5 V
A38-2 (SHFL) - A38-17 (SGF)	Ignition switch ON	0.5 to 4.5 V
A39-9 (SHRL) - A38-17 (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 05-1476)**

C → **REPLACE SUSPENSION CONTROL ECU (SEE PAGE 25-20)**

A

REPLACE AFS ECU (SEE PAGE 65-26)