

SYSTEM DESCRIPTION

1. AIR SUSPENSION SYSTEM DESCRIPTION

- (a) The suspension control ECU operates the compressor & motor with the dryer and uses the solenoid valves to control the vehicle height by analyzing the information based on the switches, sensors and input signals.
- (b) Through the 4 height control sensors, the suspension control ECU detects the changes in the vehicle height that results from the number of occupants or the amount of the load. Then, the suspension control ECU controls the height control solenoid valves and the compressor & motor with the dryer in order to automatically adjust the vehicle height to a constant (normal) vehicle height.
- (c) Furthermore, three vehicle heights can be selected by operating the height control switch: HI, Normal and LO.
- (d) When the engine is shut-off, the vehicle height can be lower than the LO vehicle height by operating the access mode switch.
- (e) In the case such as when the vehicle is jacked up, the auto leveling function is prohibited by operating the height control OFF switch.

TEST MODE PROCEDURE

1. TEST MODE PROCEDURE (USING SST CHECK WIRE)

HINT:

- When entering the test mode, the suspension control ECU sets all the test DTCs first. After completing the input signal operation for each inspection item, the DTCs that are judged normal by the suspension control ECU will be erased. The DTCs for other inspection items may not be erased when only a certain signal is inspected.
- When the test mode returns back to the normal mode, all the test DTCs will be erased.

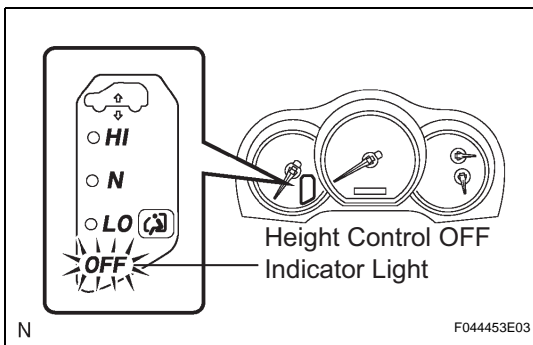
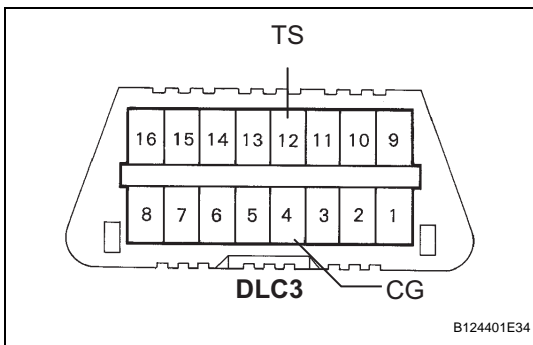
(a) Procedure for Test Mode.

- (1) Make sure that the ignition switch is off.
- (2) Set each of the check items in the table below to the condition in Operation (A).

- (3) Using SST(s), connect the terminals TS and CG of DLC3.

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- (4) Turn the ignition switch to the ON position.



- (5) Check that the height control OFF indicator light comes on and goes off at 0.125 second intervals. (4 Hz)

HINT:

If the height control OFF indicator light does not blink, inspect the height control OFF indicator light circuit or the TS terminal circuit.

Trouble Area	See procedure
Height control OFF indicator light circuit	SC-104
TS terminal circuit	SC-109

- (6) Set checking each items to the condition in Operation (B).

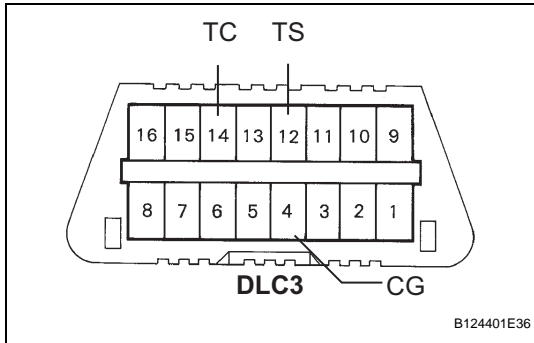
HINT:

- When checking each item, the height control OFF indicator light should come on for 1 sec. then continue blinking.
- There is no input signal order.

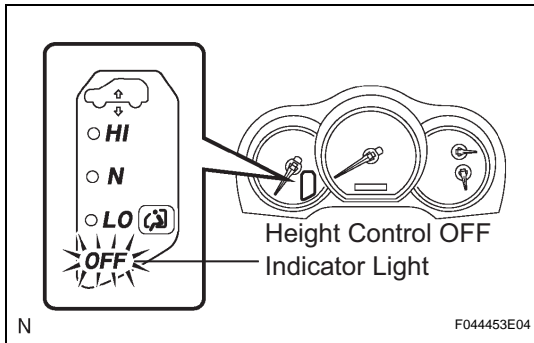
Test mode table:

Check Item	Operation (A)	Operation (B)
Stop light switch signal	OFF (Brake pedal not depressed)	ON (Brake pedal depressed)
Right rear speed sensor signal	Vehicle speed below 20 km/h (12 mph)	Vehicle speed 20 km/h (12 mph) or higher
Left rear speed sensor signal	Vehicle speed below 20 km/h (12 mph)	Vehicle speed 20 km/h (12 mph) or higher
Height control switch signal	Neutral position	Press the height control switch "UP" first and then press "DOWN"

Check Item	Operation (A)	Operation (B)
Height control OFF switch signal	OFF (Height control OFF indicator light is OFF)	ON to OFF (Height control OFF switch pushed in 2 times.)
Crankshaft position sensor signal	Engine speed below 2,000 rpm	Engine speed 2,000 rpm or higher
Access mode switch signal	OFF (Access mode switch not pushed in)	ON to OFF (Access mode switch pushed in and released)



(7) Using the SST(s), connect the 3rd terminal of the SST to terminal TC in the DLC3.
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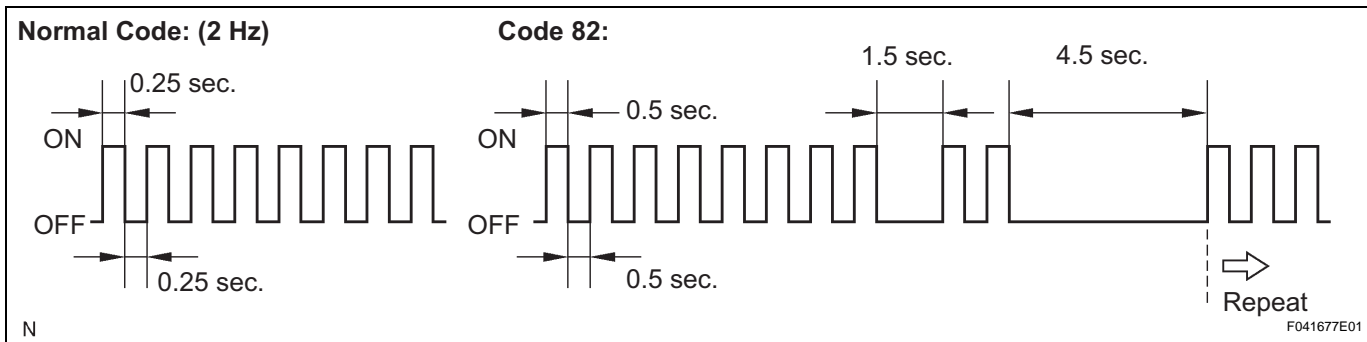


(8) Read the number of blinks of the height control OFF indicator light.

HINT:

- As an example, the blinking patterns of a normal code and code 82 are shown in the illustration.
- If 2 or more malfunctions are indicated at the same time, the lowest numbered code is displayed first.
- When a DTC or normal code is not output, check the TC terminal circuit (See page SC-106).

(9) Check the malfunction using the code table below.



(b) Clear the test DTCs and return to normal mode.
HINT:

After repairing the malfunctions, clear the test DTC.

- (1) Turn the ignition switch off.
- (2) Disconnect the SST(s) from the terminals of DLC3.

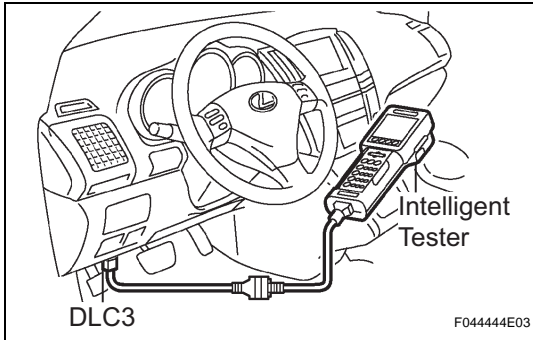
SST 09843-18040

- (3) Turn the ignition switch to the ON position.

2. TEST MODE PROCEDURE (INTELLIGENT TESTER)

HINT:

- When entering the test mode, the suspension control ECU sets all the test DTCs first. After completing the input signal operation for each inspection item, the DTCs that are determined normal by the suspension control ECU will be erased. The DTCs for other inspection items may not be erased when only a certain signal is inspected.
- When the test mode returns back to the normal mode, all the test DTCs will be erased.



(a) Procedure for Test Mode.

- (1) Make sure that the ignition switch is OFF.
- (2) Set each of the check items to the condition in Operation (A) in the test mode table.
- (3) Connect the intelligent tester to DLC3.
- (4) Turn the ignition switch to the ON position.
- (5) Select the SIGNAL CHECK mode on the intelligent tester.
- (6) Set each of the check items to the condition in Operation (B) in the test mode table.

HINT:

In step (6), all signals can be checked together.

- (7) Read the DTCs by following the prompts on the tester screen.

HINT:

Refer to the intelligent tester operator's manual for further details.

- (8) After completing the input signal check, disconnect the tester and turn the ignition switch off.

DTC of Air Suspension System test mode function:

If a malfunction code is displayed during the test mode DTC check, check the circuit listed for that code. For details of each code, refer to the "See procedure" under respective "DTC No." in the chart.

DTC No. (See procedure)	Detection Item	Trouble Area
C1782/82 (SC-90)	Stop light switch circuit malfunction	<ul style="list-style-type: none"> • Stop light switch assembly • Stop light switch circuit • Suspension control ECU
C1784/84 (SC-84)	Right rear speed sensor circuit malfunction	<ul style="list-style-type: none"> • Right rear speed sensor • Right rear speed sensor circuit • Skid control ECU (Brake actuator assembly) • Suspension control ECU
C1785/85 (SC-84)	Left rear speed sensor circuit malfunction	<ul style="list-style-type: none"> • Left rear speed sensor • Left rear speed sensor circuit • Skid control ECU (Brake actuator assembly) • Suspension control ECU
C1786/86 (SC-93)	Height control switch circuit malfunction	<ul style="list-style-type: none"> • Height control switch • Height control switch circuit • Suspension control ECU
C1788/88 (SC-96)	Height control OFF switch circuit malfunction	<ul style="list-style-type: none"> • Height control OFF switch • Height control OFF switch circuit • Suspension control ECU

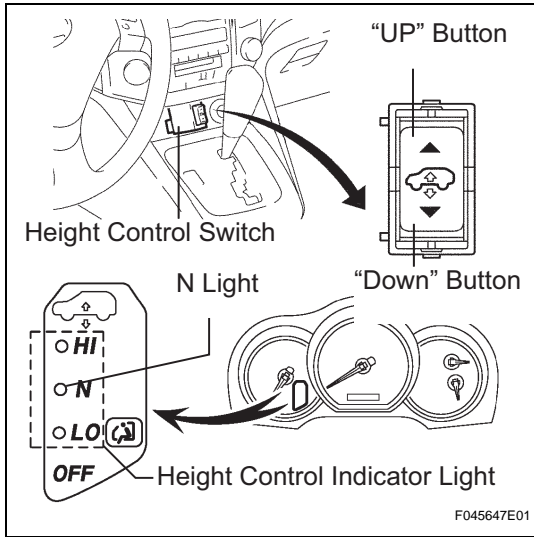
DTC No. (See procedure)	Detection Item	Trouble Area
C1797/97 (SC-87)	Crankshaft position sensor circuit malfunction	<ul style="list-style-type: none"> • Crankshaft position sensor • Crankshaft position sensor circuit • ECM • Suspension control ECU

3. ADJUST VEHICLE HEIGHT (WHEN USING INTELLIGENT TESTER)

HINT:

Leave the driver's seat window open to make height control operation easier.

- (a) Start the engine.
- (b) Change the height control switch to the "N" position.
- (c) Check that the blinking for the "N" light in the combination meter is on.
- (d) Push the access mode switch to the off position.
- (e) Stop the engine and turn the ignition switch OFF.



- (f) HINT:
Refer to the illustration.

Front	Measured height B minus A
Rear	Measured height D minus C

- A: Ground clearance of lower front suspension arm No. 2 bush set bolt center.
 B: Ground clearance of front wheel center.
 C: Ground clearance of strut rod set bolt center.
 D: Ground clearance of rear wheel center.

- (g) If the value of the vehicle height is not within the range of the standard value, note the value measured and proceed to the following step.

Standard value table

4WD	2WD
112 +- 10 mm (4.406 +- 0.393 in.)	117 +- 10 mm (4.602 +- 0.393 in.)
36 +- 10 mm (1.421 +- 0.393 in.)	41 +- 10 mm (1.618 +- 0.393 in.)

HINT:

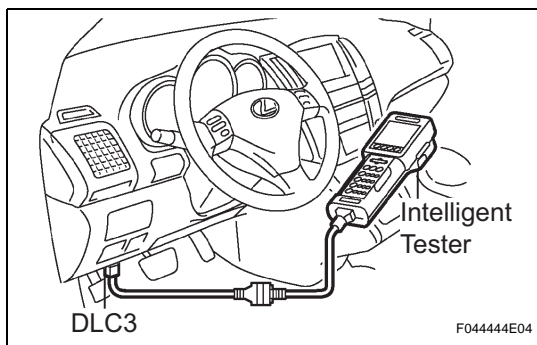
The difference between the right and the left sides should be less than 10 mm (0.39 in.).

NOTICE:

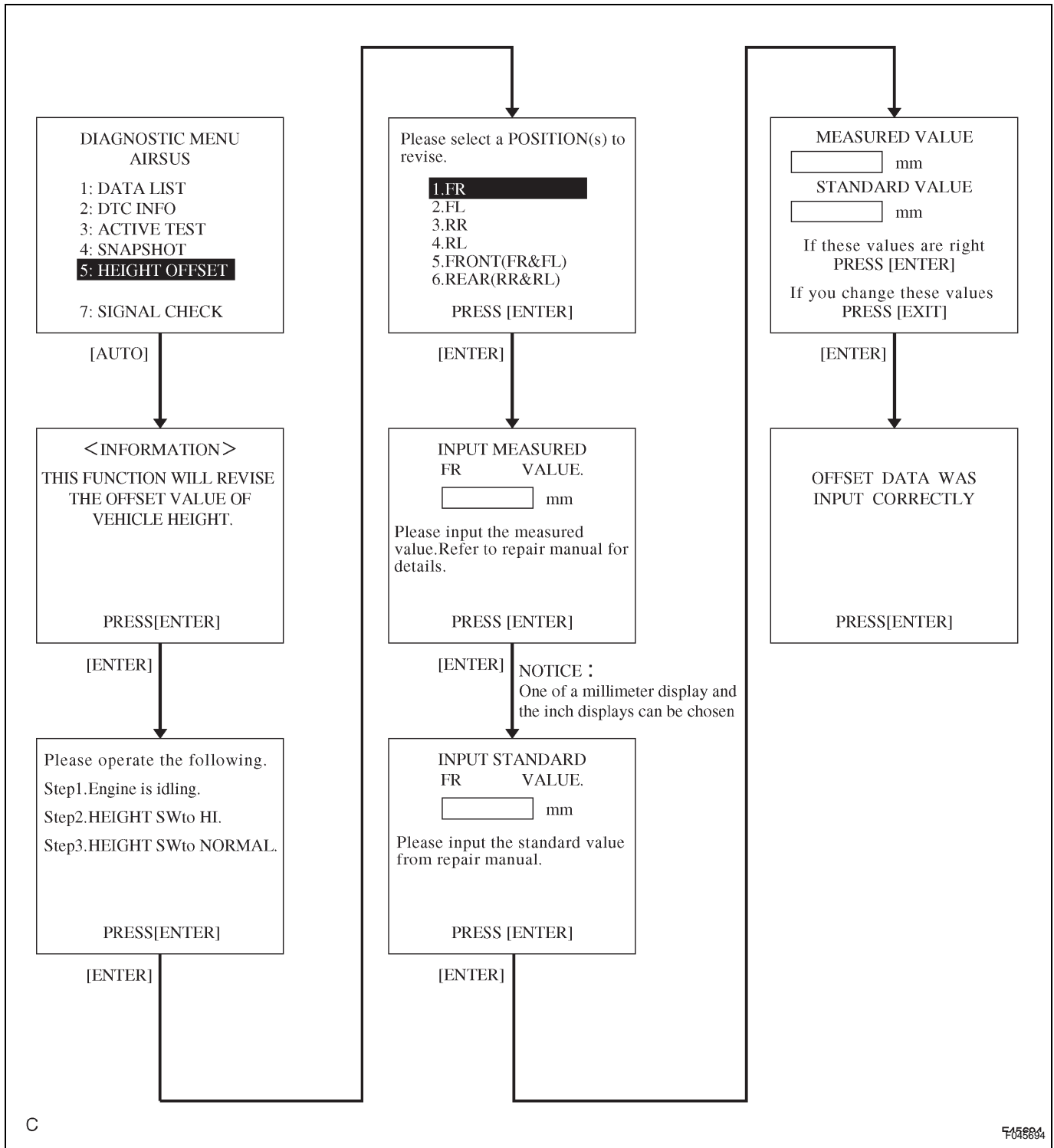
In the case where the difference between the value of the vehicle height and standard value exceeds 80 mm (3.15 in.), this check cannot be performed by using the intelligent tester.

In order to perform the check with the intelligent tester, adjust the difference below 80 mm (3.15 in.) without using the intelligent tester. Check the height control sensor sub-assembly (See page [SC-36](#)).

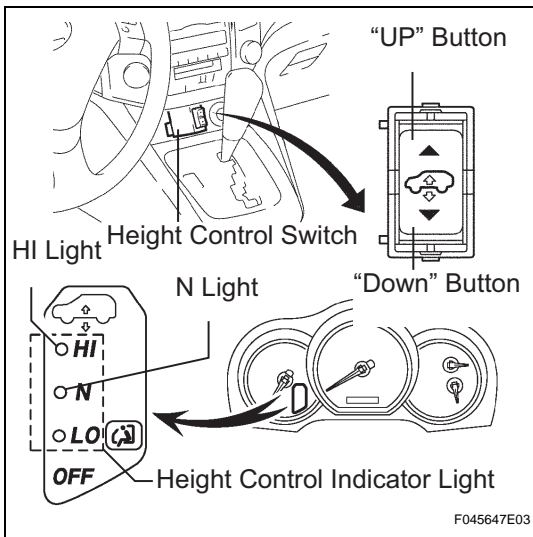
- (h) Connect the intelligent tester to DLC3.
- (i) Turn the ignition switch to the ON position.



(j) Perform the height offset procedure from the AIRSUS menu.



(k) Start the engine.



- (l) Change the height control switch to the "HI" position and check that the blinking for the "HI" light on the meter has been changed to the illuminating.
- (m) Change the height control switch to the "N" position again and get out of the vehicle immediately while the "N" light is blinking.

NOTICE:

Be sure to get out of the vehicle while the light is blinking as the height will be changed and the value will not be measured properly if you fail to do so.

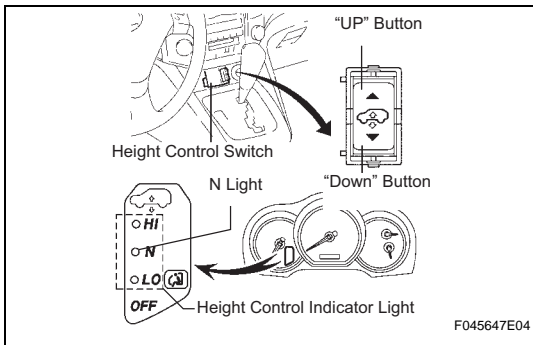
- (n) Turn the ignition switch to the OFF position from outside of the vehicle after the "N" light comes on.
- (o) Check the vehicle height again to confirm the value of the vehicle height is within the range of the standard values.

NOTICE:

Do not touch the vehicle as its height may be changed.

4. ADJUST VEHICLE HEIGHT (WHEN NOT USING INTELLIGENT TESTER)

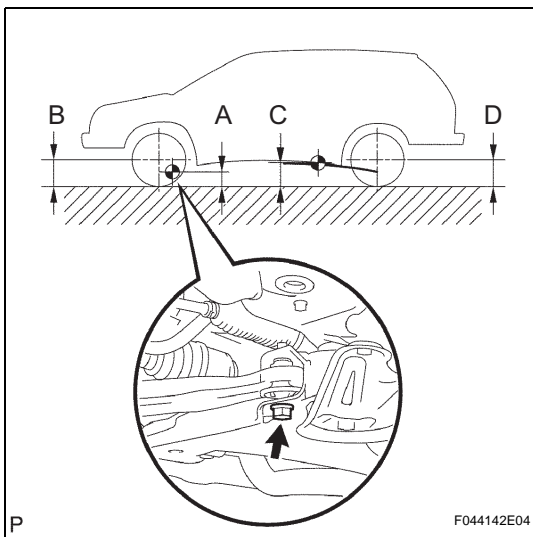
- (a) Start the engine.
- (b) Change the height control switch to the "N" position.
- (c) Check that the blinking for the "N" light on the meter has been changed to the illuminating.
- (d) Stop the engine and turn the ignition switch OFF.

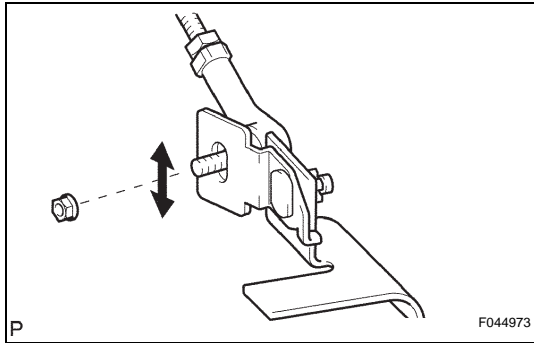


- (e) Check the vehicle height (calculated value).
- HINT:**
 Leave the driver's seat window open to make height control operation easier.
- A: Ground clearance of lower suspension arm No. 2 bush set bolt center.
 - B: Ground clearance of front wheel center.
 - C: Ground clearance of strut rod set bolt center.
 - D: Ground clearance of rear wheel center.
- (f) If the value of the vehicle height is not within the range of the standard value, note the value measured and proceed to the following step.

Standard value table

4WD	2WD
112 +/- 10 mm (4.406 +/- 0.393 in.)	117 +/- 10 mm (4.602 +/- 0.393 in.)
36 +/- 10 mm (1.421 +/- 0.393 in.)	41 +/- 10 mm (1.618 +/- 0.393 in.)



**HINT:**

Difference between the right and the left sides should be less than 10 mm (0.39 in.).

- (g) Adjust the front vehicle height control sensor links.

NOTICE:

- **Adjust the link of which the value for the vehicle height control is most beyond the range of the standard value first.**
- **If the values of the front vehicle height and the rear vehicle height are the same, adjust the front vehicle height control sensor link first.**

- (1) Loosen the nut and adjust the link position by moving it up and down along the bracket's hole on the vehicle.

HINT:

The vehicle height will be changed by approx. 5 mm (0.19 in.) when changing the link by approx. 1 mm (0.04 in.)

- (2) Tighten the nut on the vehicle height control sensor link.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

- (h) Adjust the rear vehicle height control sensor links.

- (1) Loosen the 2 lock-nuts on the vehicle height control sensor link and turn the link to adjust its length.

HINT:

- Lengthen the link to raise the vehicle height.
- Shorten the link to lower the vehicle height.

• **2WD:**

The vehicle height will be changed by approx. 8 mm (0.31 in.) when turning the rear vehicle height control sensor link around once.

• **4WD:**

The vehicle height will be changed by approx. 3 mm (0.12 in.) when turning the rear vehicle height control sensor link around once.

- (2) Check if the vehicle height control sensor link dimension (A) shown in the illustration is shorter than the standard value.

Standard length:

18.0 mm (0.708 in.) or less

- (3) Tighten the 2 lock-nuts on the vehicle height control sensor link.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

- (i) Check the vehicle height again to confirm the value of the vehicle height is within the range of the standard value.

- (j) Adjust the headlight aim only (See page [LI-196](#)).

