

Last Modified: 12-04-2024	6.11:8.1.0	Doc ID: RM1000000295CJ
Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [12/2022 -]
Title: ADVANCED DRIVER ASSISTANCE SYSTEM: FRONT SIDE RADAR SENSOR: CHECK REFLECTION POWER; 2023 - 2024 MY Prius Prime [12/2022 -]		

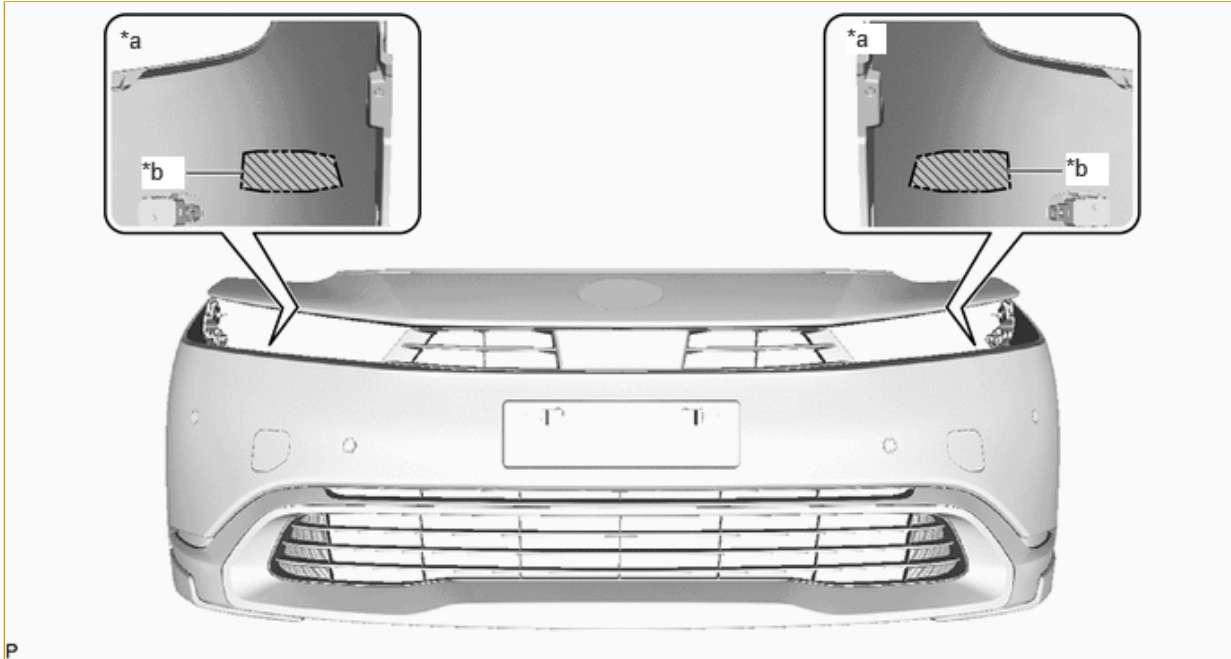
CHECK REFLECTION POWER


PROCEDURE

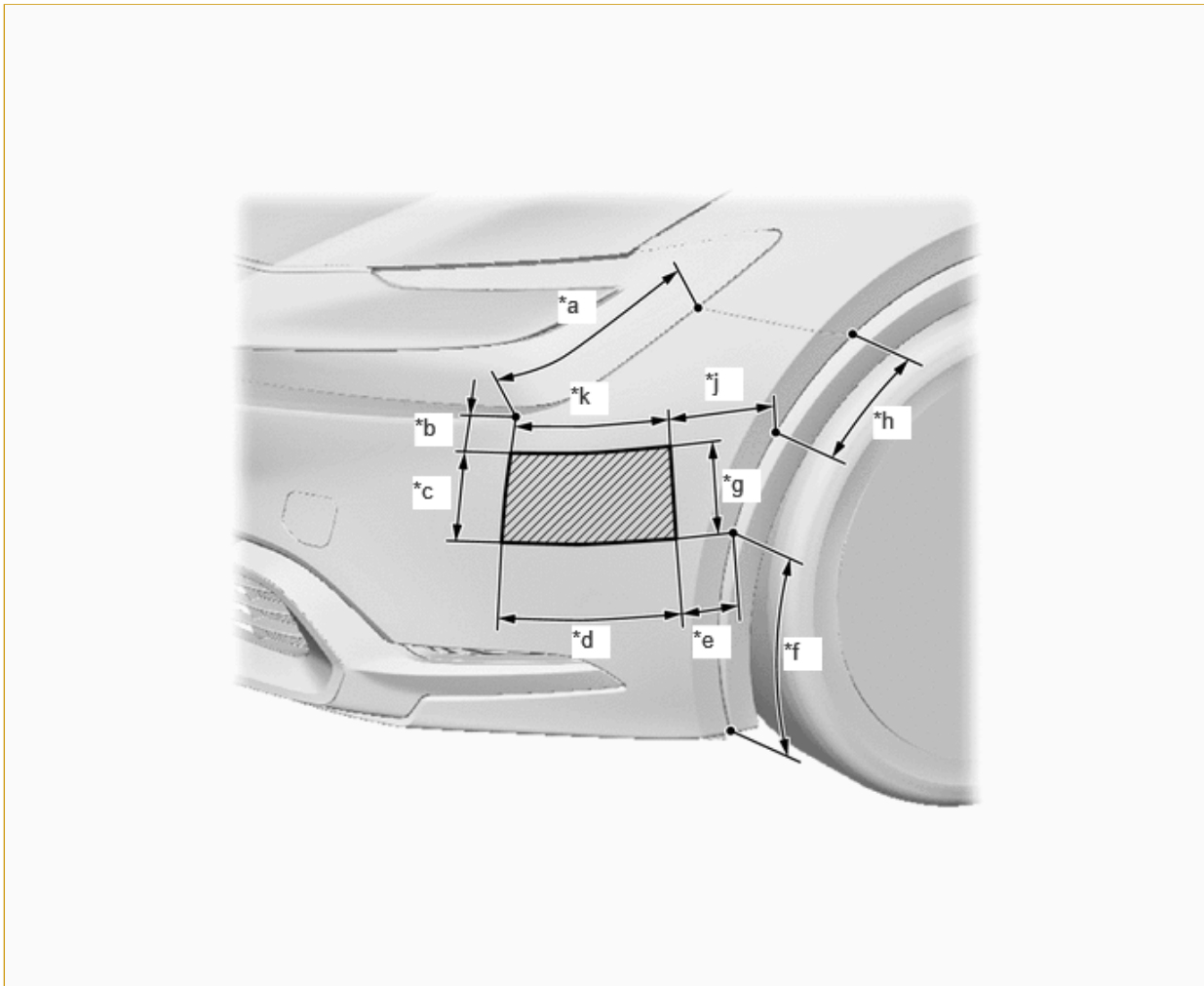
1. CHECK FRONT SIDE RADAR SENSOR REFLECTION POWER


NOTICE:

- If body repairs have been performed at the radio wave transmission area of the front bumper cover, be sure to perform "Check Reflection Power".



*a	Bumper Rear Side	*b	Scribed Line
	Radio Wave Transmission Area	-	-



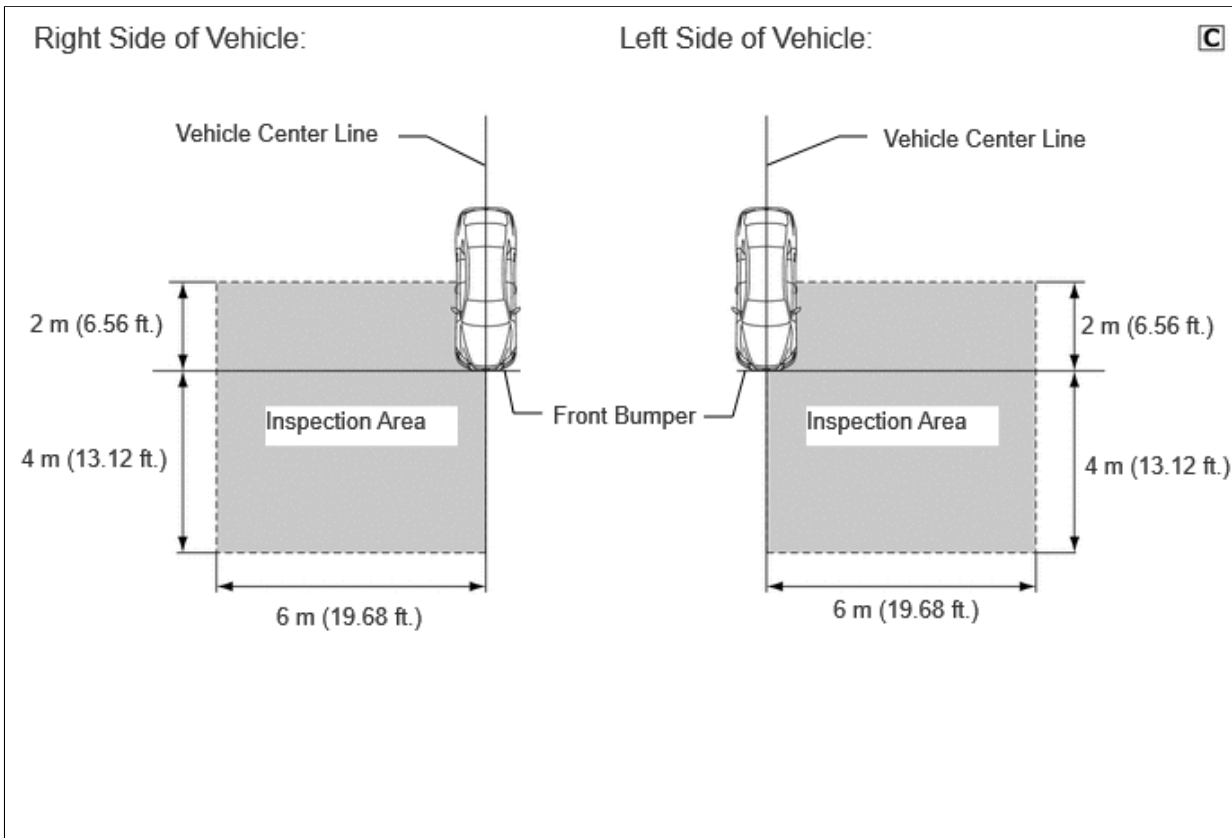
*a	282 mm (11.10 in.)	*b	48 mm (1.89 in.)
*c	122 mm (4.80 in.)	*d	224 mm (8.82 in.)
*e	79 mm (3.11 in.)	*f	291 mm (11.46 in.)
*g	122 mm (4.80 in.)	*h	156 mm (6.14 in.)
*j	146 mm (5.75 in.)	*k	206 mm (8.11 in.)
	Radio Wave Transmission Area	-	-

- "Check Reflection Power" enables the reflection power to be checked after beam axis alignment in accordance with the following procedure.

HINT:

- Since radio waves from the front side radar sensor pass through the front bumper cover, if body repairs have been performed at the radio wave transmission area, radio wave transmission may be attenuated.
- Perform "Check Reflection Power" with and without the front bumper assembly installed to check the difference.

(a) When performing the front side radar beam axis confirmation, move the vehicle to a place where the space shown in the illustration can be secured.



NOTICE:

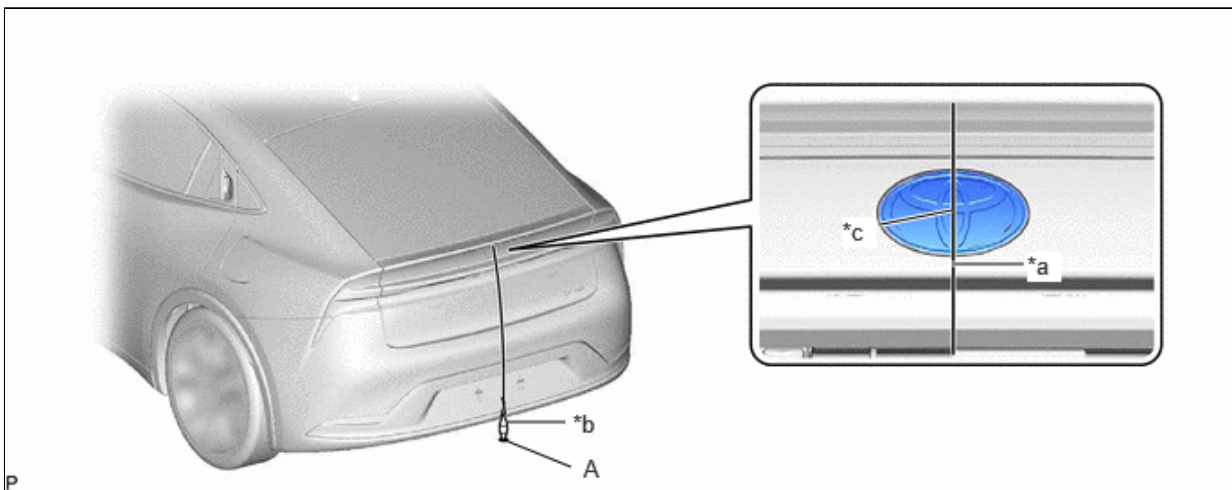
- Perform this inspection on level ground.
- Make sure that there are no metal objects around the vehicle or on the ground.
- Unload the vehicle before beginning the inspection.
- Confirm that the tire pressure is correct before beginning the inspection.

Click here [INFO](#)

- Do not place any objects other than the reflector (such as a large metallic object) in the inspection area or allow people to enter the inspection area (W 6 m [19.68 ft.] x L 6 m [19.68 ft.] x H 3 m [9.84 ft.]) shown in the illustration.

(b) Place the reflector.

- (1) Hang a weight with a pointed tip from the center of the rear emblem, and mark the rear center point of the vehicle (point A) on the ground.

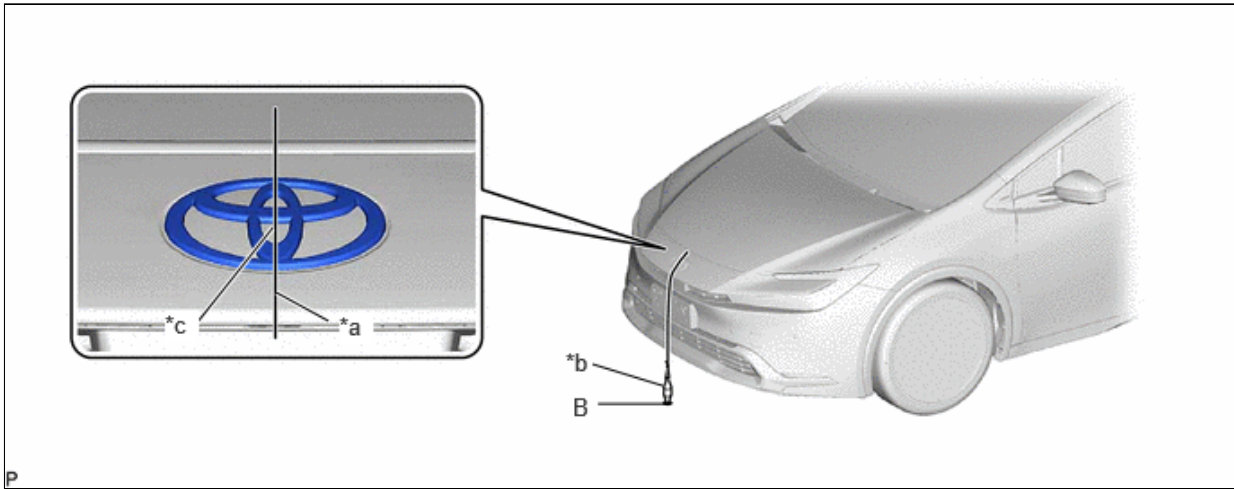


*a	String	*b	Weight
*c	Center	-	-

HINT:

Lightly flick the string with your fingers several times to confirm that the string is perpendicular to the ground.

(2) Hang a weight with a pointed tip from the center of the radiator grille (or front panel) emblem, and mark the front center point of the vehicle (point B) on the ground.



*a	String	*b	Weight
*c	Center	-	-

HINT:

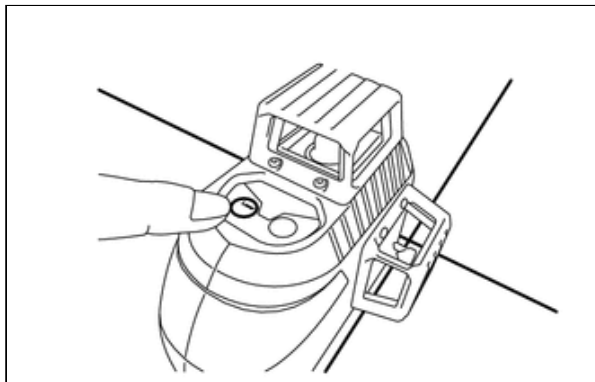
Lightly flick the string with your fingers several times to confirm that the string is perpendicular to the ground.

(3) When using a laser line marker:

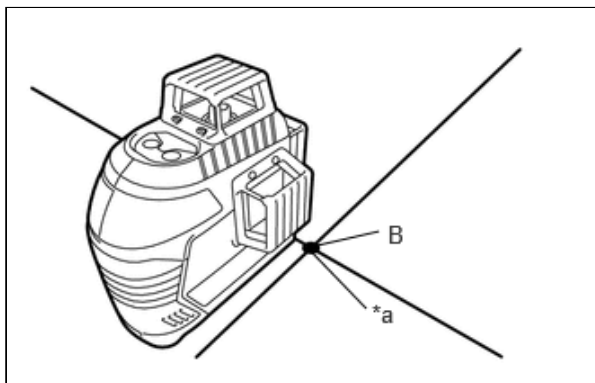
NOTICE:

Do not look directly into the laser beam.

1. Press the laser mode button on the laser line marker to activate the laser line emitters.

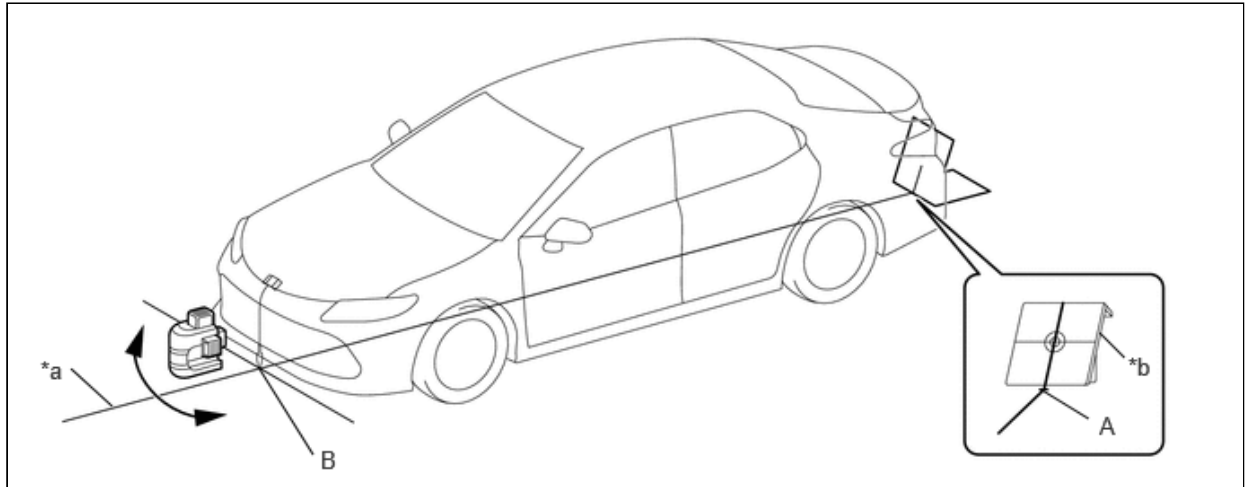


2. Align the laser beam ground marking point (cross portion) with point B.



*a	Ground Marking Point (Cross Portion)
----	--------------------------------------

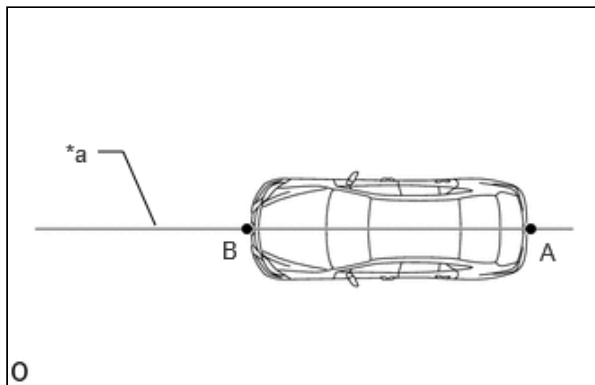
3. Align the center of the target panel with point A, and set the target panel so that it faces forward.



*a	Center Line	*b	Target Panel
----	-------------	----	--------------

4. Adjust the position of the laser line marker so that the laser beam is aligned with the center line of the target panel.

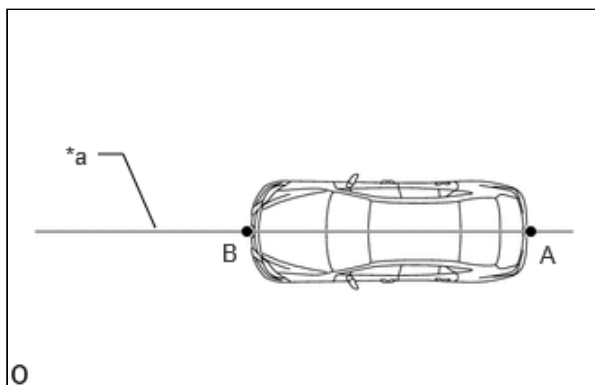
5. Using a laser marker, create a vehicle center line that connects point A and point B.



*a	Vehicle Center Line
----	---------------------

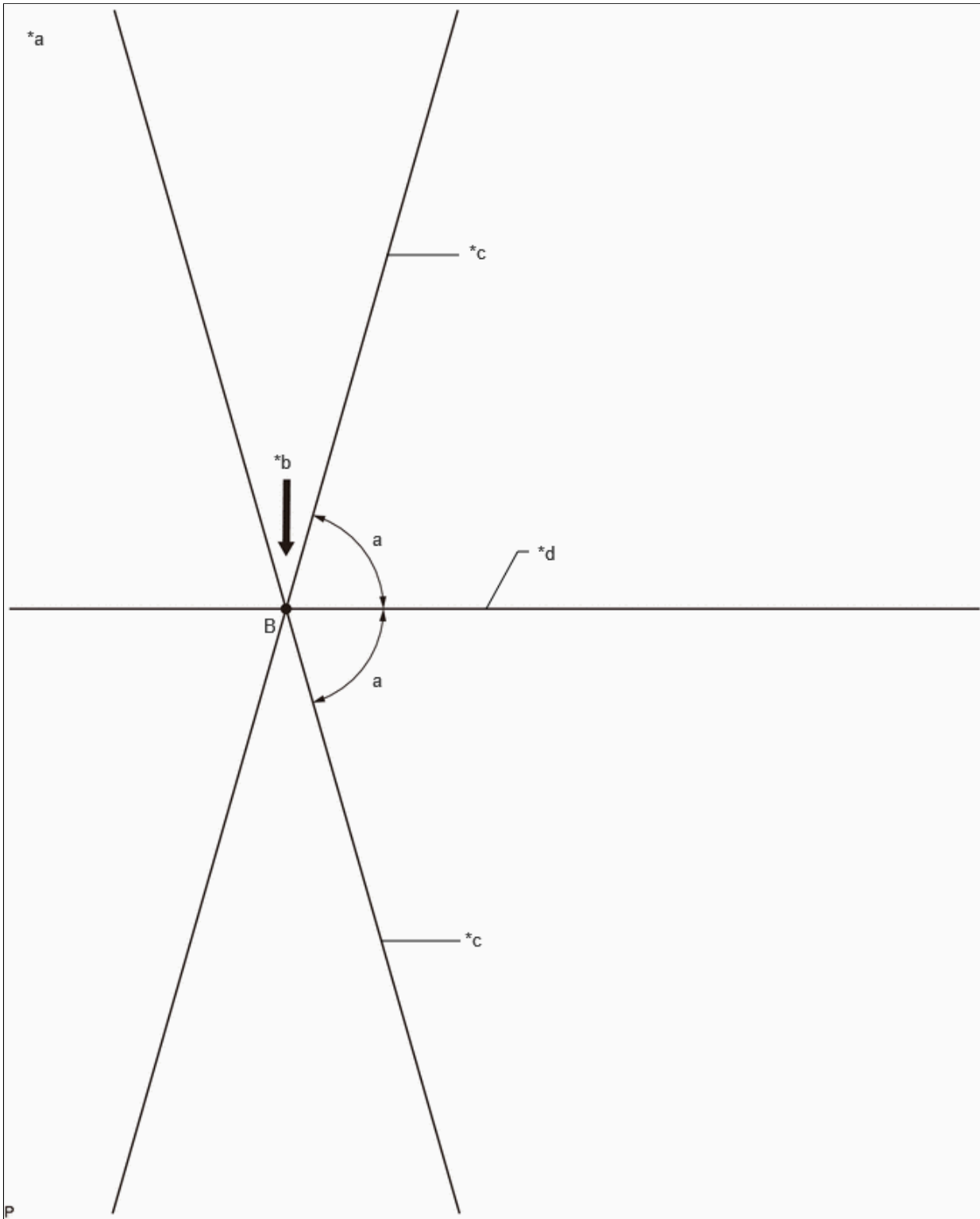
(4) When not using a laser line marker:

1. Draw a vehicle center line so that it passes through mark A and B (front and rear center points).



*a	Vehicle Center Line
----	---------------------

(5) Enlarge and print out the poster shown in the illustration.

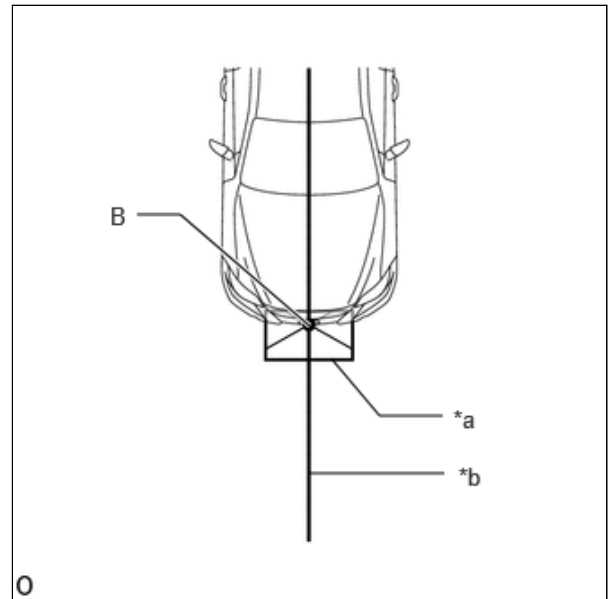


*a	Poster	*b	Edge of Front Bumper
*c	Line C	*d	Vehicle Center Line

Standard:

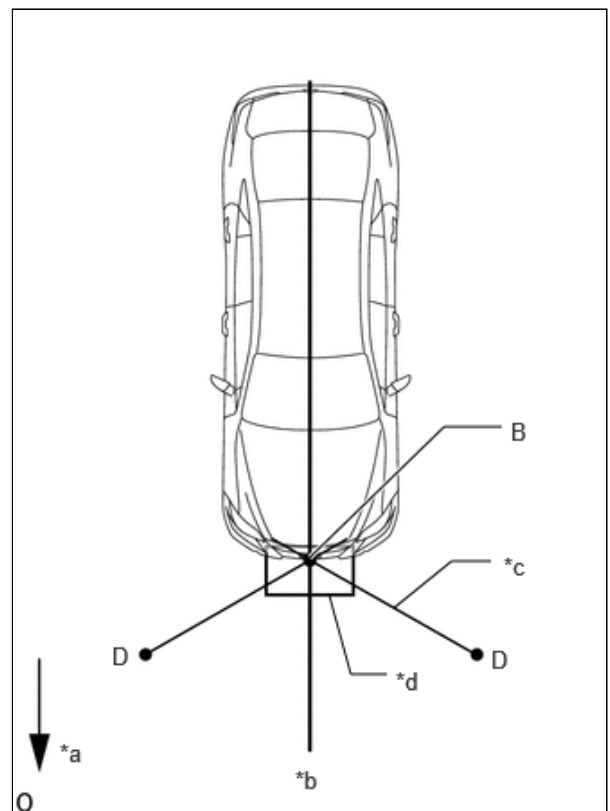
PART	ANGLE
a	74°

(6) Attach the printed poster to the floor with the vehicle center line aligned with point B as shown in the illustration.



*a	Poster
*b	Vehicle Center Line

(7) Align a piece of string with line C and mark point D at a distance of 3088 mm (10.13 ft.) from point B.



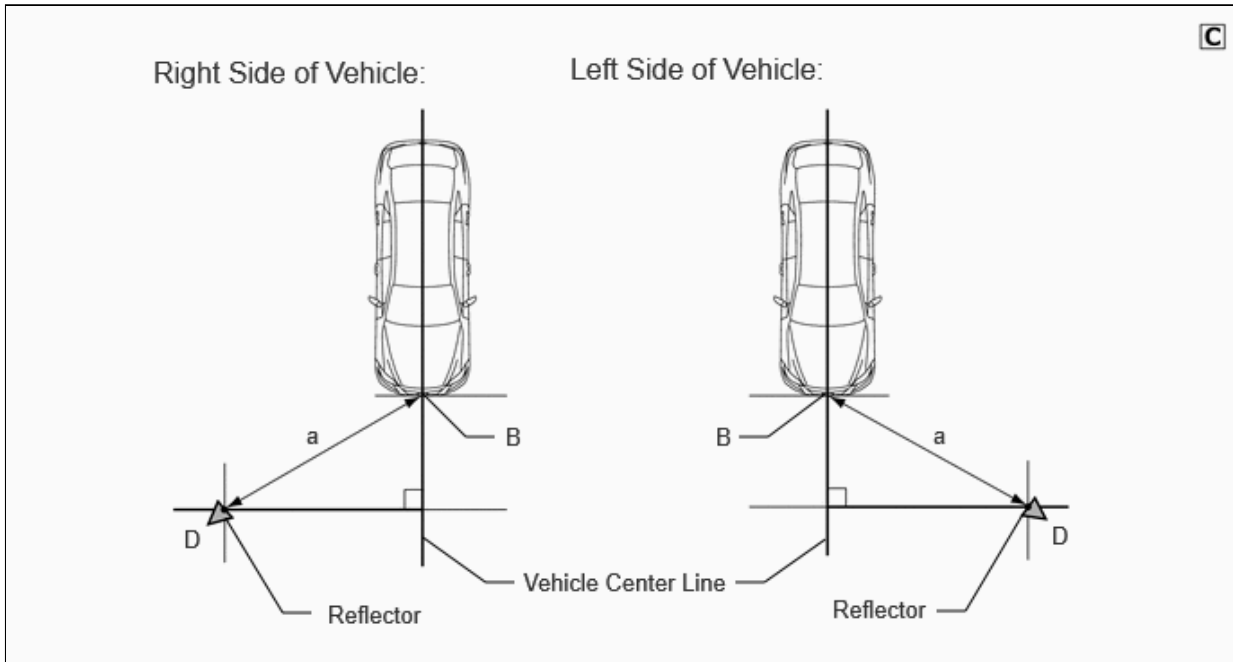
*a	Vehicle Front
*b	Vehicle Center Line
*c	String
*d	Poster

(8) Set the reflector at the point D shown in the illustration below.

SST: 09870-60000

09870-60010

SST: 09870-60040

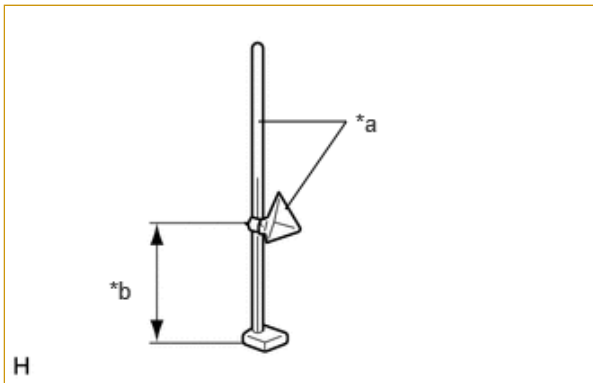


Standard:

PART	LENGTH
a	3088 mm (10.13 ft.)

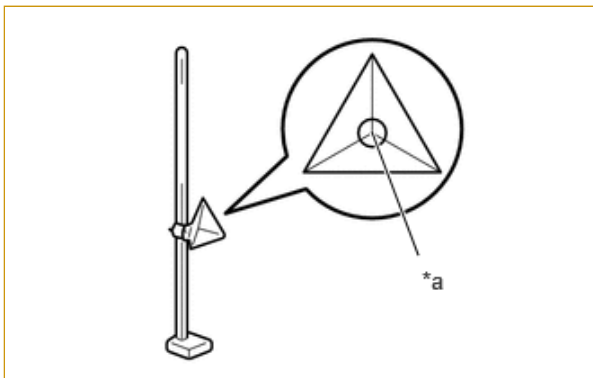
NOTICE:

- Set the reflector so that its center is 551 mm (1.81 ft.) above the ground.

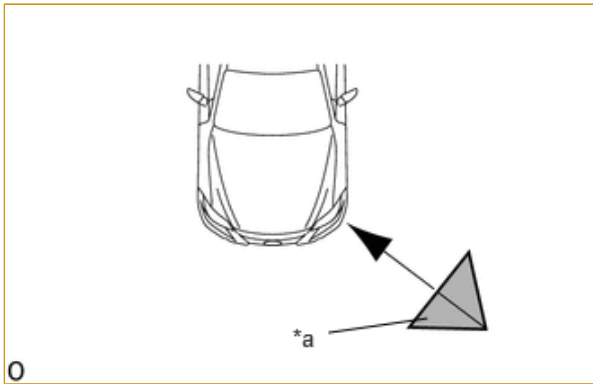


*a	SST (reflector)
*b	551 mm (1.81 ft.)

- The center of the triangular pyramid is the reference point for the setting position and angle.



*a Center of Triangular Pyramid



*a SST (reflector)

(c) Check reflection power.

- (1) Turn the ignition switch off.
- (2) Connect the GTS to the DLC3.
- (3) Turn the ignition switch ON and turn the front side radar system on.
- (4) Turn the GTS on.
- (5) Enter the following menus: Body Electrical / Front Side Radar "A" or Front Side Radar "B" / Utility / Front Side Radar "A" Beam Axis Display or Front Side Radar "B" Beam Axis Display.

HINT:

The "A" is on the LH side and the "B" is on the RH side.

Body Electrical > Front Side Radar "A" > Utility

TESTER DISPLAY
Front Side Radar "A" Beam Axis Display

Body Electrical > Front Side Radar "B" > Utility

TESTER DISPLAY
Front Side Radar "B" Beam Axis Display

- (6) Confirm the conditions displayed on the screen, and then press "Next" (*1).
- (7) Perform the procedure in accordance with the instructions on the screen.
- (8) Check the results displayed for the front side radar beam axis display.

Allowable Range

ITEM	FRONT SIDE RADAR SENSOR ("A")	FRONT SIDE RADAR SENSOR ("B")
Angle	-4.1 to +4.1°	-4.1 to +4.1°

HINT:

If the displayed results are outside the permissible range, the following are possible causes. Therefore, implement countermeasures, check the front side radar beam axis and perform the procedure again.

POSSIBLE CAUSES	COUNTERMEASURE
Incorrect SST (reflector) position	Check the position of SST (reflector) and checking space and perform the procedure again

POSSIBLE CAUSES	COUNTERMEASURE
A metallic object is located in the vicinity of the checking space	Check the position of SST (reflector) and checking space and perform the procedure again
The front side radar sensor installation is abnormal	Check the installation condition of the front side radar sensor Click here INFO

(9) Enter the following menus: Body Electrical / Front Side Radar "A" or Front Side Radar "B" / Utility / Front Side Radar "A" Beam Axis Adjustment or Front Side Radar "B" Beam Axis Adjustment.

HINT:

The "A" is on the LH side and the "B" is on the RH side.

Body Electrical > Front Side Radar "A" > Utility

TESTER DISPLAY
Front Side Radar "A" Beam Axis Adjustment

Body Electrical > Front Side Radar "B" > Utility

TESTER DISPLAY
Front Side Radar "B" Beam Axis Adjustment

(10) Confirm the conditions displayed on the screen, and then press "Next".

(11) In accordance with the screen, perform Front Side Radar "A" Beam Axis Adjustment or Front Side Radar "B" Beam Axis Adjustment.

HINT:

When values on the axis display are in the allowable range, performing this adjustment compensates for any deviation from the normal value.

(12) After front side radar beam axis adjustment is complete, note the value of "Reflector Reflection Power".

HINT:

- Do not move the reflector after removing the front bumper assembly, so that the process can be started again from "Front Side Radar Beam Axis Display" (*1).
- If the reflector is moved, variations in the measured values occur and the results cannot be accurately compared.

(13) Remove the front bumper assembly.

Click here [INFO](#)

(14) Perform the procedure again from "Front Side Radar Beam Axis Display" (*1) and note the value of "Reflector Reflection Power".

(15) Check the difference in value of "Reflector Reflection Power" with and without the front bumper assembly installed and confirm that the result is as specified.

HINT:

- Subtract the value with the front bumper assembly removed from the value with the front bumper assembly installed, and then check the result.
- If different reflectors are used with the front bumper assembly installed and removed, the measured values will vary and the correct difference cannot be determined.

(16) Calculate the difference in reflection power.

HINT:

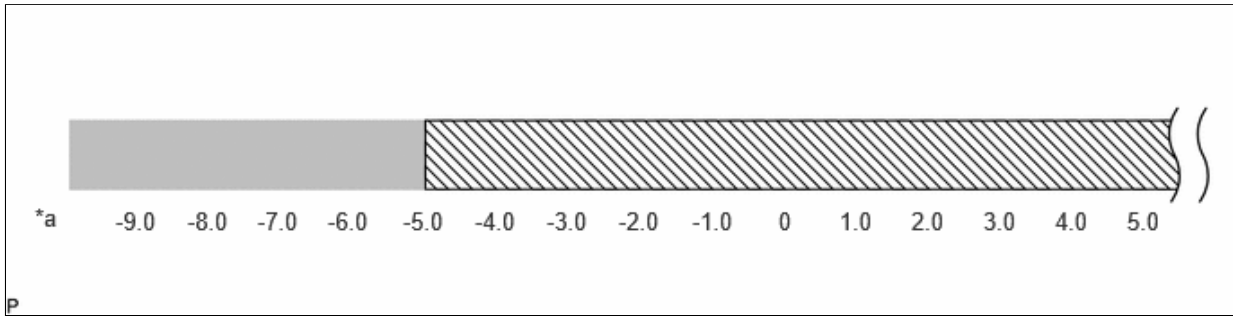
Formula: front bumper assembly installed - front bumper assembly removed



Standard:

ITEM	STANDARD
Front Side Radar Sensor ("A")	-5.0 or higher
Front Side Radar Sensor ("B")	-5.0 or higher

HINT:

If the calculated value is -5.0 or higher, there is no problem.



*a	Calculated Value	-	-
	Outside Specified Range		Within Specified Range

(17) If the difference in "Reflector Reflection Power" is outside of the specified range:

1. Suspect the following possible causes and perform the appropriate countermeasures:

POSSIBLE CAUSES	COUNTERMEASURE
<ul style="list-style-type: none"> When the front bumper cover panel was painted, too much paint base was applied. Excessive addition of aluminum primary color 	Strip the front bumper cover back to its base material, and then repaint.
Operation of the front side radar sensor is abnormal.	Replace the front side radar sensor.

HINT:

If the result is outside of the specified range, it is suspected that body repair performed on the front bumper cover is reducing the reflection power.

2. After performing the appropriate countermeasures above, perform the operation again from "Front Side Radar Beam Axis Display"(*1) and confirm that "Reflector Reflection Power" is within the acceptable range.

HINT:

Refer to the body repair manual "INTRODUCTION > WORK NOTICES AND PRECAUTIONS > PRECAUTIONS FOR FRONT SIDE RADAR SENSOR".

(18) Install the front bumper assembly.

Click here [INFO](#)

(d) After "Check Reflection Power" is completed, check "Radio Wave Irradiation Condition" of the millimeter wave radar sensor assembly.

HINT:

When performing the beam axis alignment, temporarily disable operation of the millimeter wave radar sensor assembly to prevent exposure to radio waves from the millimeter wave radar sensor assembly.

(1) Enter the following menus: Body Electrical / Front Radar Sensor / Data List / Radio Wave Irradiation Condition.

Body Electrical > Front Radar Sensor > Data List

TESTER DISPLAY	MEASUREMENT ITEM	RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Radio Wave Irradiation Condition	Status of radio wave irradiation	Under Radio Wave Irradiation or Under Radio Wave Stopping	Under Radio Wave Irradiation: Radio wave irradiation status displayed Under Radio Wave Stopping: Radio wave irradiation stopped status displayed	-

Body Electrical > Front Radar Sensor > Data List

TESTER DISPLAY
Radio Wave Irradiation Condition

Standard:

The value of the Data List item is displayed as "Under Radio Wave Irradiation".

(2) When the value is "Under Radio Wave Stopping":

1. Enter the following menus: Body Electrical / Front Radar Sensor / Utility / Radio Wave Irradiation Stop Mode Cancellation.

Body Electrical > Front Radar Sensor > Utility

TESTER DISPLAY
Radio Wave Irradiation Stop Mode Cancellation

(e) After beam axis adjustment completes, clear the following system vehicle control history entries.

(1) Clear vehicle control history (Front Side Radar Sensor System).

Click here [INFO](#)

(2) Clear vehicle control history (Front Camera System).

Click here [INFO](#) [INFO](#)

