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Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [03/2023 -]
Title: MAINTENANCE: FRONT WHEEL ALIGNMENT: ADJUSTMENT; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

ADJUSTMENT

CAUTION / NOTICE / HINT

The necessary procedures (adjustment, calibration, initialization, or registration) that must be performed after completing the front wheel alignment procedure are shown below.

Necessary Procedures After Parts Removed/Installed/Replaced

REPLACED PART OR PERFORMED PROCEDURE	NECESSARY PROCEDURE	EFFECT/INOPERATIVE FUNCTION WHEN NECESSARY PROCEDURE NOT PERFORMED	LINK
Front wheel alignment adjustment	Perform "Calibration"	<ul style="list-style-type: none"> • DTCs are stored • ABS warning light illuminates • Brake system warning light (yellow indicator) illuminates • Slip indicator light illuminates • Electronically controlled brake system disabled or malfunctions 	INFO
Tires	<ul style="list-style-type: none"> • Initialization*1*2 • Tire Position Identification*1*2 	Tire Pressure Warning System	Refer to Procedures Necessary When Replacing Parts (for Tire Pressure Warning System) table below INFO
	Rear television camera assembly optical axis (Back camera position setting)*3	Parking Assist Monitor System	INFO
	Parking assist ECU initialization*3	Panoramic View Monitor System	INFO
		Advanced Park	INFO

*1: Also necessary after performing a tire rotation.

*2: It is not necessary to perform this procedure if the tire pressure warning valve and transmitters are installed to the same location.

*3: The vehicle height changes because of suspension or tire replacement.

PROCEDURE

1. INSPECT TIRES

(a) Inspect the tires for wear and proper inflation pressure.

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(b) Check the runout of the tires.

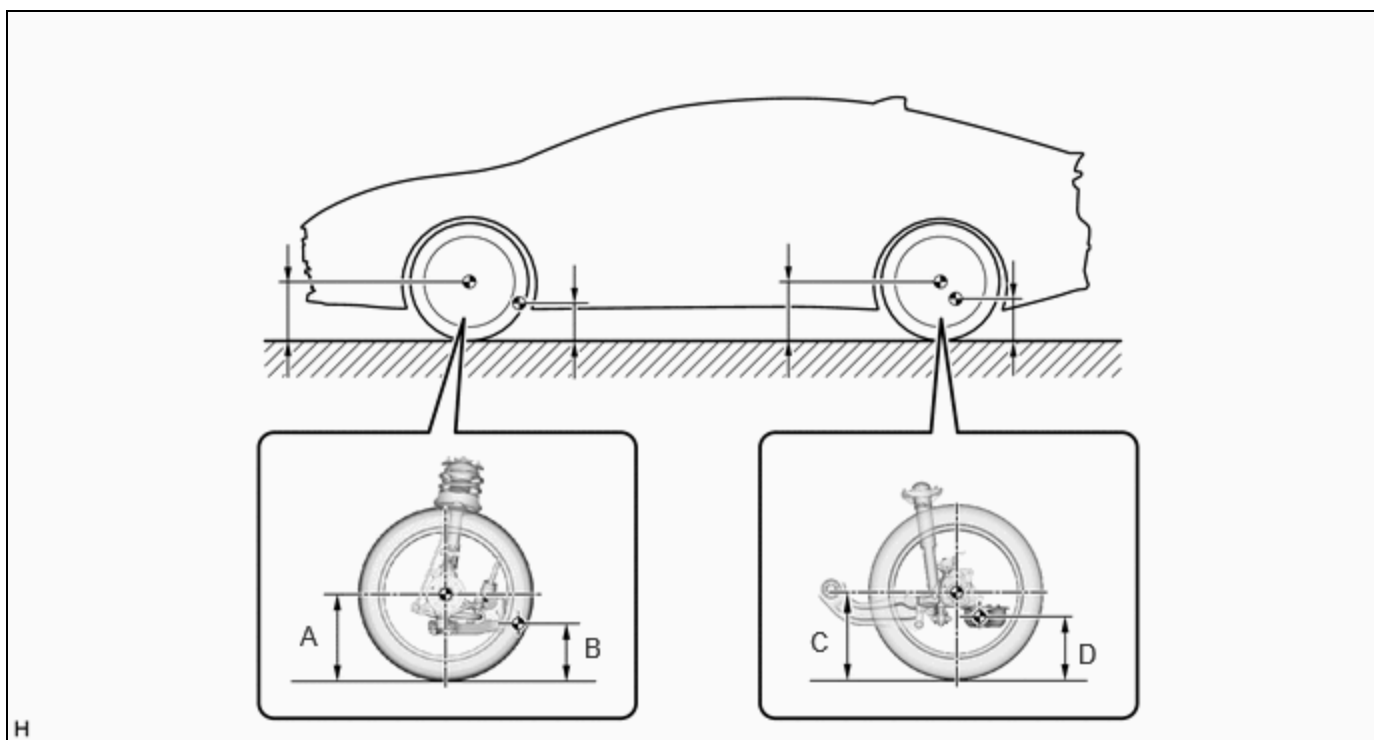
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2. MEASURE VEHICLE HEIGHT

NOTICE:

- Before inspecting the wheel alignment, adjust the vehicle height to the specified value.
- Be sure to perform measurement on a level surface.
- If it is necessary to go under the vehicle for measurement, confirm that the parking brake is applied and the vehicle is secured with chocks.
- Inspect while the vehicle is unloaded.
- The standard value shown here is a value that is used for performing a wheel alignment and does not indicate the height of an actual vehicle.

(a) Bounce the vehicle up and down at the corners to stabilize the suspension.



(b) Measure the vehicle height.

Measurement Points:

A: Ground clearance of front wheel center

B: Ground clearance of center of bolt head of front lower No. 2 suspension arm bushing (rear bolt of front lower No. 1 suspension arm sub-assembly).

C: Ground clearance of rear wheel center

D: Ground clearance of center of tip of threaded portion of rear lower No. 2 suspension arm assembly and rear suspension member sub-assembly.

Vehicle Height (Unloaded Vehicle):

ENGINE	DRIVE TYPE	FRONT A - B	REAR C - D
M20A-FXS	2WD	115 mm (4.53 in.)	58 mm (2.28 in.) 62 mm (2.44 in.)*
	AWD	115 mm (4.53 in.)	60 mm (2.36 in.)
2ZR-FXE	2WD	105 mm (4.13 in.)	50 mm (1.97 in.)

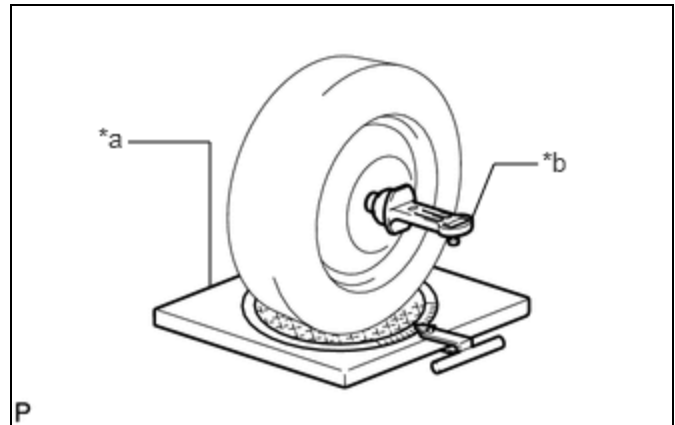
*:for PHEV

3. INSPECT CAMBER, CASTER AND STEERING AXIS INCLINATION

NOTICE:

Inspect while the vehicle is unloaded.

(a) Install a camber-caster-kingpin gauge and place the front wheels on the center of a turning radius gauge.



*a	Turning Radius Gauge
*b	Camber-caster-kingpin Gauge

(b) Inspect the camber, caster and steering axis inclination.

Camber (Unloaded Vehicle):

ENGINE	CAMBER INCLINATION	RIGHT-LEFT DIFFERENCE
M20A-FXS	-0°33' +/- 0°45' (-0.55° +/- 0.75°)	0°45' (0.75°) or less
2ZR-FXE	-0°27' +/- 0°45' (-0.45° +/- 0.75°)	

Caster (Unloaded Vehicle):

ENGINE	DRIVE TYPE	TIRE SIZE	CASTER INCLINATION	RIGHT-LEFT DIFFERENCE
M20A-FXS	2WD	195/60R17	7°05' +/- 0°45' (7.08° +/- 0.75°) 7°11' +/- 0°45' (7.18° +/- 0.75°)*	0°45' (0.75°) or less
		195/50R19	7°06' +/- 0°45' (7.10° +/- 0.75°) 7°12' +/- 0°45' (7.20° +/- 0.75°)*	
	AWD	195/60R17 195/50R19	7°09' +/- 0°45' (7.15° +/- 0.75°)	

*:for PHEV

ENGINE	DRIVE TYPE	TIRE SIZE	CASTER INCLINATION	RIGHT-LEFT DIFFERENCE
2ZR-FXE	2WD	195/60R17	6°58' +/- 0°45' (6.97° +/- 0.75°)	
*:for PHEV				

Steering Axis Inclination (Unloaded Vehicle):

ENGINE	STEERING AXIS INCLINATION REFERENCE
M20A-FXS	14°33' (14.55°)
2ZR-FXE	14°19' (14.32°)

4. ADJUST CAMBER

NOTICE:

Inspect toe-in after the camber has been adjusted.

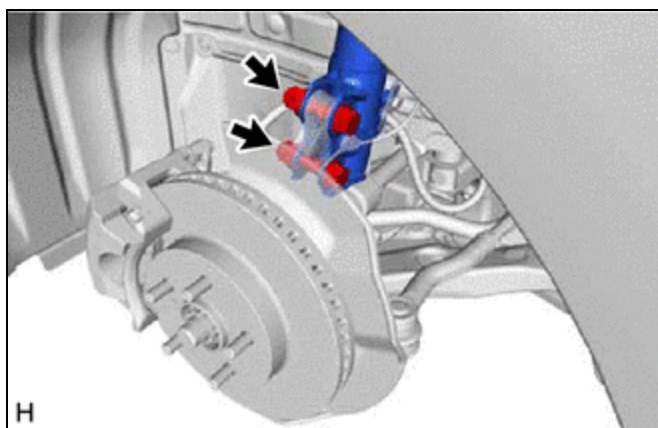
(a) Remove the front wheel.

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(b) Remove the 2 nuts on the lower side of the front shock absorber assembly.

NOTICE:

Keep the bolts inserted.



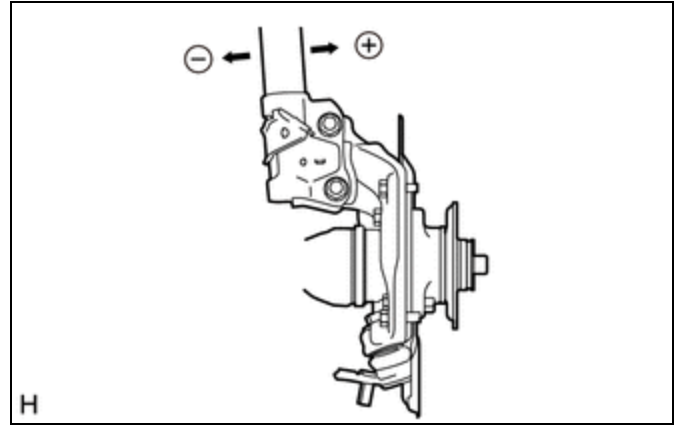
(c) Remove the top and bottom bolts one at a time and confirm that the steering knuckle can move freely in the front shock absorber assembly.

HINT:

- Reinstall each bolt after removing it and confirming steering knuckle movement.
- If the steering knuckle does not move freely in the front shock absorber assembly, clean the contact surfaces of the front shock absorber assembly and the steering knuckle.

(d) Temporarily install the 2 nuts. (Step A)

(e) Fully push or pull the front axle hub in the direction of the required adjustment. (Step B)



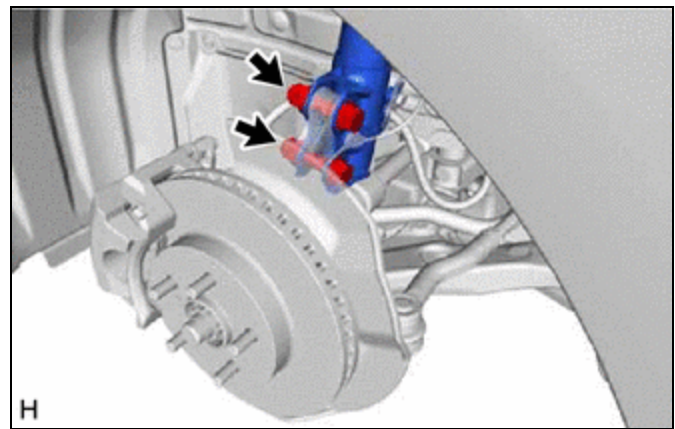
(f) Tighten the 2 nuts.

Torque:

270 N·m {2753 kgf·cm, 199 ft·lbf}

NOTICE:

Keep the bolts from rotating when tightening the nuts.



(g) Install the front wheel.

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(h) Bounce the vehicle up and down at the corners to stabilize the suspension.

(i) Check the camber.

Camber (Unloaded Vehicle):

ENGINE	CAMBER INCLINATION	RIGHT-LEFT DIFFERENCE
M20A-FXS	-0°33' +/- 0°45' (-0.55° +/- 0.75°)	0°45' (0.75°) or less
2ZR-FXE	-0°27' +/- 0°45' (-0.45° +/- 0.75°)	

(1) If the measured value is not within the specification, calculate the required adjustment amount using the formula below.

Camber adjustment amount = center of the specified range - measured value

Check the combination of the installed bolts.
 Select appropriate bolts from the tables below to adjust the camber to the specified values.

HINT:

Try to adjust the camber to the center of the specified values.

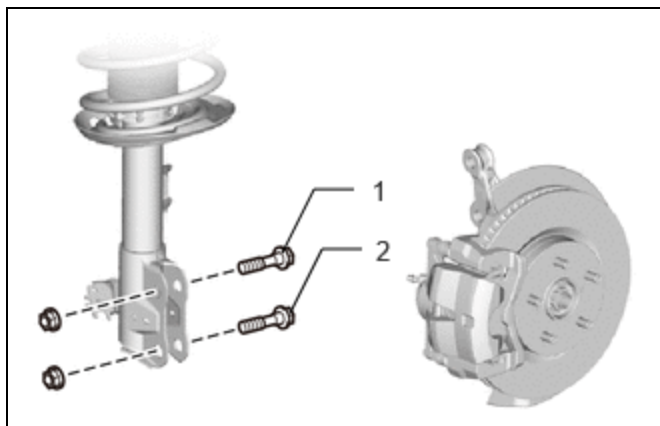
TO MOVE THE AXLE HUB TOWARD (+) IN STEP B	TO MOVE THE AXLE HUB TOWARD (-) IN STEP B
Refer to table (1) (To move the axle hub toward the positive side)	Refer to table (2) (To move the axle hub toward the negative side)

The vehicle body and suspension may be damaged if the camber cannot be correctly adjusted according to the table above.





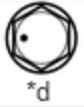









NOTICE:

Replace the nut with a new one when replacing the bolt.




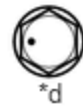










(2) Table (1) (To move the axle hub toward the positive side)



***A**

*a *b	1							
	2							
	-1°30' to -1°15' (-1.50° to -1.25°)							G
	-1°15' to -1°00' (-1.25° to -1°)						G	A
	-1°00' to -0°45' (-1° to -0.75°)					G	A	B
	-0°45' to -0°30' (-0.75° to -0.5°)				G	A	B	C
	-0°30' to -0°15' (-0.5° to -0.25°)			G	A	B	C	D
	-0°15' to 0° (-0.25° to 0°)		G	A	B	C	D	E
	0° to 0°15' (0° to 0.25°)	A	B	C	D	E	F	
	0°15' to 0°30' (0.25° to 0.5°)	B	C	D	E	F		
	0°30' to 0°45' (0.5° to 0.75°)	C	D	E	F			
	0°45' to 1°00' (0.75° to 1°)	D	E	F				
	1°00' to 1°15' (1° to 1.25°)	E	F					
	1°15' to 1°30' (1.25° to 1.5°)	F						

***B**

	A	B	C	D	E	F	G
1							
2							

*A	Table (1) (To move the axle hub toward the positive side)	*B	Selected Bolt Combination
*a	Installed Bolt	*b	Adjusting Value
*c	Standard Bolt	*d	90105-17013
*e	90105-17014	*f	90105-17015

(3) Table (2) (To move the axle hub toward the negative side)

***A**

*a *b	1							
	2							
-1°30' to -1°15' (-1.50° to -1.25°)		F						
-1°15' to -1°00' (-1.25° to -1°)		E	F					
-1°00' to -0°45' (-1° to -0.75°)		D	E	F				
-0°45' to -0°30' (-0.75° to -0.5°)		C	D	E	F			
-0°30' to -0°15' (-0.5° to -0.25°)		B	C	D	E	F		
-0°15' to 0° (-0.25° to 0°)		A	B	C	D	E	F	
0° to 0°15' (0° to 0.25°)			G	A	B	C	D	E
0°15' to 0°30' (0.25° to 0.5°)				G	A	B	C	D
0°30' to 0°45' (0.5° to 0.75°)					G	A	B	C
0°45' to 1°00' (0.75° to 1°)						G	A	B
1°00' to 1°15' (1° to 1.25°)							G	A
1°15' to 1°30' (1.25° to 1.5°)								G

***B**

	A	B	C	D	E	F	G
1							
2							

*A	Table (2) (To move the axle hub toward the negative side)	*B	Selected Bolt Combination
*a	Installed Bolt	*b	Adjusting Value
*c	Standard Bolt	*d	90105-17013
*e	90105-17014	*f	90105-17015

(j) If the camber was out of adjustment in the previous step, perform the adjust camber steps mentioned above. In step A, replace the existing bolts with the selected bolts.

HINT:

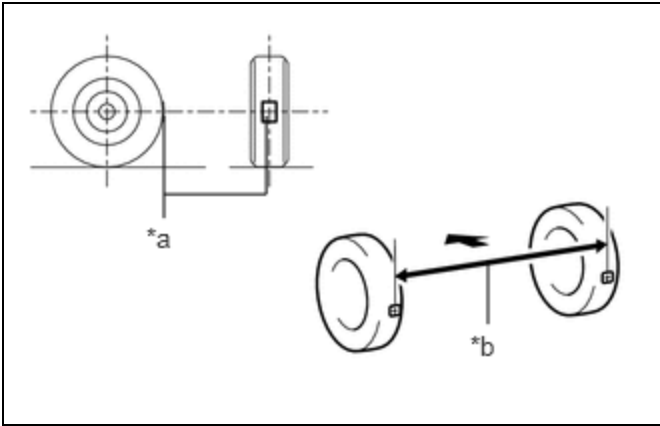
Replace one bolt at a time when replacing both bolts.


5. INSPECT TOE-IN

NOTICE:

Inspect while the vehicle is unloaded.

- (a) Bounce the vehicle up and down at the corners to stabilize the suspension.
- (b) Release the parking brake and move the shift lever to N.
- (c) Push the vehicle straight ahead approximately 5 m (16.4 ft.). (Step C)
- (d) Put tread center marks on the rearmost points of the front wheels and measure the distance between the marks (dimension B).



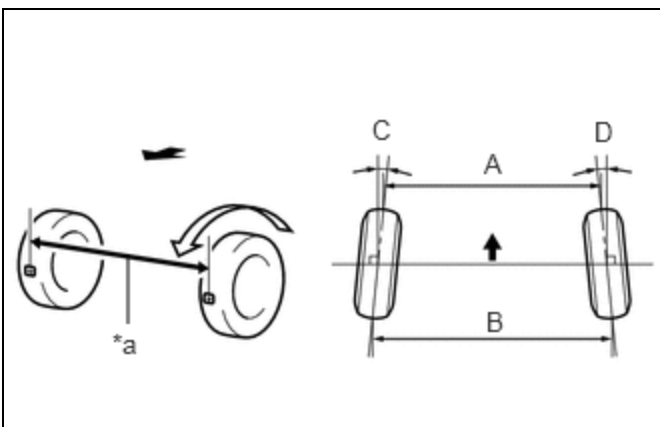
*a	Tread Center Mark
*b	Dimension B
	Front of the Vehicle


- (e) Slowly push the vehicle straight ahead to cause the front wheels to rotate 180°. Use the front tire valve as a reference point.

HINT:

Do not allow the wheels to rotate more than 180°. If the wheels rotate more than 180°, perform the procedure from step C again.

- (f) Measure the distance between the tread center marks on the front of the wheels (dimension A).



*a	Dimension A
	Front of the Vehicle

Toe-in (Unloaded Vehicle):

ENGINE	TIRE SIZE	SPECIFIED CONDITION
M20A-FXS	195/60R17	C + D: 0°06' +/- 0°10' (0.10° +/- 0.17°)
		B - A: 1.2 +/- 2.0 mm (0.0472 +/- 0.0787 in.)
	195/50R19	C + D: 0°06' +/- 0°10' (0.10° +/- 0.17°)
		B - A: 1.2 +/- 2.0 mm (0.0472 +/- 0.0787 in.)
2ZR-FXE	195/60R17	C + D: 0°05' +/- 0°10' (0.08° +/- 0.17°)
		B - A: 0.9 +/- 2.0 mm (0.0354 +/- 0.0787 in.)

HINT:

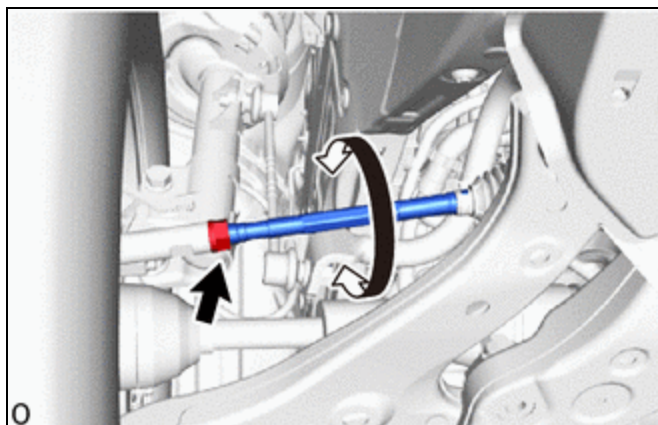
Measure "B - A" only when "C + D" cannot be measured.

If the toe-in is not within the specified range, adjust it at the steering rack ends.

6. ADJUST TOE-IN

- (a) Separate the steering rack boot clips from the steering rack boot.

- (b) Loosen the tie rod assembly lock nuts.

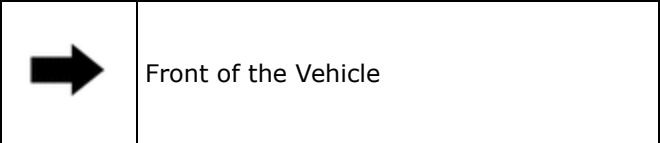
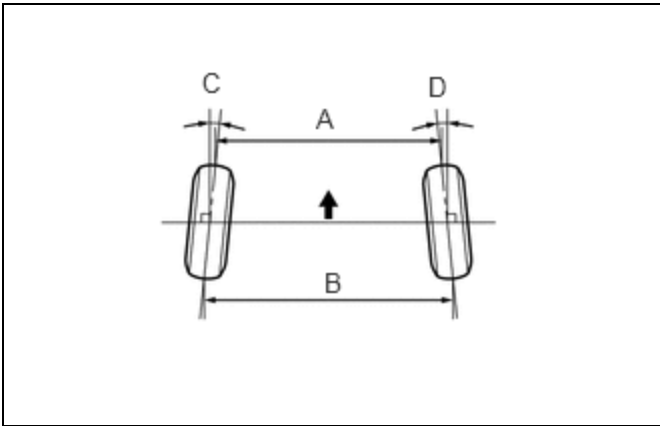


- (c) Turn the right and left steering rack ends by an equal amount to adjust the toe-in.

HINT:

- If the toe-in measurement is greater than the specified range (too much toe-out), extend the shorter rack end so that the difference in length is within the specified range.
- If the toe-in measurement is less than the specified range (too much toe-in), shorten the longer rack end so that the difference in length is within the specified range.

- (d) Measure the toe-in.



Toe-in (Unloaded Vehicle):

ENGINE	TIRE SIZE	SPECIFIED CONDITION
M20A-FXS	195/60R17	C + D: 0°06' +/- 0°10' (0.10° +/- 0.17°)
		B - A: 1.2 +/- 2.0 mm (0.0472 +/- 0.0787 in.)
	195/50R19	C + D: 0°06' +/- 0°10' (0.10° +/- 0.17°)
		B - A: 1.2 +/- 2.0 mm (0.0472 +/- 0.0787 in.)
2ZR-FXE	195/60R17	C + D: 0°05' +/- 0°10' (0.08° +/- 0.17°)
		B - A: 0.9 +/- 2.0 mm (0.0354 +/- 0.0787 in.)

HINT:

Perform adjustments so that the value is as close as possible to the median of the specified range.

(e) Tighten the tie rod assembly lock nuts.

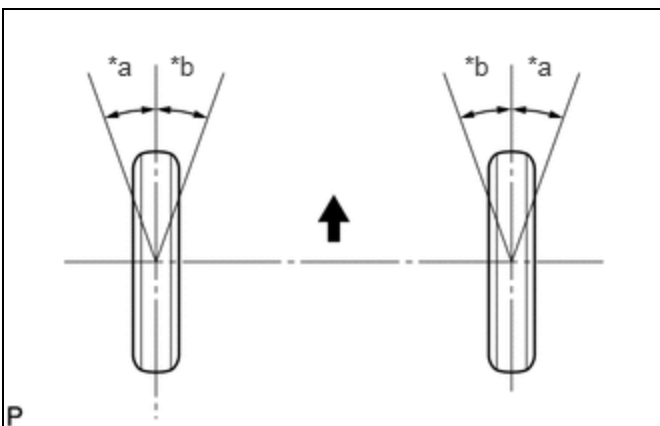
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(f) Place the steering rack boots on the seats and install the steering rack boot clips.

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7. INSPECT WHEEL ANGLE

(a) Put tread center marks on the rearmost points of a turning radius gauge.



*a	Inside
*b	Outside
	Front of the Vehicle

(b) Turn the steering wheel fully to the left and right and measure the turning angle.

NOTICE:

Inspect while the vehicle is unloaded.

Wheel Turning Angle (Unloaded Vehicle):

ENGINE	TIRE SIZE	INSIDE WHEEL	OUTSIDE WHEEL
M20A-FXS	195/60R17	41°07' +/- 2°00' (41.12° +/- 2.00°)	34°52' (34.87°)
	195/50R19	39°28' +/- 2°00' (39.47° +/- 2.00°)	33°53' (33.88°)
2ZR-FXE	195/60R17	41°22' +/- 2°00' (41.37° +/- 2.00°)	35°12' (35.20°)

If the right and left inside wheel angles differ from the specified value, check and adjust the right and left steering rack end lengths.

8. ALIGN FRONT WHEELS FACING STRAIGHT AHEAD

9. PERFORM CALIBRATION

